

## MAKING SUBJECT MATTER PART OF THE CONVERSATION OR HELPING BEGINNING TEACHERS LEARN TO TEACH

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This paper considers the place of subject matter concerns in conversations between experienced teachers and beginning teachers. It asks the question, To what extent and in what ways do issues about content, and the teaching and learning of content figure in the interactions between novices and their mentors? In posing this question, we adopt a lens that is rarely used to describe the problems of beginning teachers, or the goals of first year teacher programs.

### **Silent on Subject Matter**

The literature on beginning teachers pays little attention to content-specific issues. According to one extensive review of research (Veenman, 1984), novices are mainly preoccupied with management and discipline. Instructional concerns take a back seat to issues of control. There is a widespread belief that, until novices learn to manage students, they cannot concentrate on teaching them.

The experience of assistance-oriented induction programs provides some support for this developmental claim. According to one expert, beginning teachers who receive support and guidance move more quickly from concerns about discipline, management, and control to instructional concerns. The implication is that providing support to beginning teachers diminishes discipline problems and increases attention to instructional issues (Odell, 1986).

A major goal of beginning teacher assistance programs, "improving instruction," is often defined in generic, behavioral terms. A recent synthesis of research on the effects of induction programs illustrates the tendency to equate instructional improvement with discrete changes in teaching performance. All the studies cited to support the claim that induction programs promote instructional improvement present findings in the form of generic teaching behaviors. In one year-end study, for example, first-year teachers reported the following kinds of changes as a result of the assistance they received: "I've changed little things like voice inflection and eye contact"; "I've changed my pacing; I was going too fast, especially through the transitions"; and "I've begun to use different techniques like going from the chalkboard to the overhead in the same class." On the basis of this evidence, the researchers conclude: "Most of the changes *are of an instructional nature and are of the type that directly influence the quality of instruction with students*" [emphasis added] (Huling-Austin and

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Murphy, 1987, p. 23).

In a second study, beginning teachers listed 20 ideas which they had acquired from their induction program. These included better use of instructional time, better use of classroom management techniques, improved record keeping system, use of praise. Studies such as these suggest that at least some induction programs and the researchers who evaluate them have adopted a generic definition of effective teaching supported by teacher effectiveness research (for a summary of this work, see Brophy and Good, 1986).

One factor that may direct attention away from subject matter concerns is the belief that beginning teachers already have adequate subject matter knowledge. Alternate route programs rest on such an assumption. These programs provide on-the-job training for beginning teachers who have completed a bachelor's degree with an academic major. Majoring in an academic subject is supposed to ensure that alternate route teachers know their subjects well enough to teach them. Some teacher educators make a similar claim about beginning teachers who have completed programs of preservice preparation. Commenting on the assumptions behind assistance-based induction programs, Odell (1989) observes: "Beginning teachers, although *well prepared in content* [emphasis added] and theory, still have much to learn about putting their knowledge to work" (p. 27).

The apparent lack of attention to subject matter concerns in the literature puzzled us as we thought about the realities of teaching and learning to teach. Teachers are supposed to see that pupils learn worthwhile content. That is a central task of teaching (Doyle, 1986; Feiman-Nemser and Buchmann, 1987). Moreover, whatever preparation beginning teachers have, there are some aspects of teaching that can only be learned *in situ*. New teachers must learn how to engage a specific group of students in worthwhile learning and adapt particular curricula to their needs and capabilities. Beginning teachers do not have a large repertoire of strategies for representing and presenting their content. Further, they do not have an elaborated understanding of what students are like as learners, how they think about particular topics, what problems they encounter in learning specific content. Thus it was hard for us to imagine that experienced teachers working with beginning teachers would not talk about content and the teaching and learning of content.

### **Sources of Data**

This paper grew out of our puzzlement. We decided to look more closely at *actual* conversations between experienced and beginning teachers to see whether and how subject matter concerns entered in. The data we examined were drawn from two first-year teacher programs in which experienced teachers provide support and guidance to novices. Both programs are part of a larger study of teacher education and learning to teach conducted by the National Center for Research on Teacher Education, located at Michigan State University.

The first program is an induction program. Sponsored by a university and a local school district, it provides assistance and support to new elementary teachers, some of whom are also enrolled in a master's program. The second program, sponsored by a school district, provides assistance and support to beginning secondary teachers and an alternate route to certification.

While both programs help beginning teachers, they differ in significant ways. The induction program is an extension of teacher preparation, serving teachers who have already completed a preservice program leading to elementary certification. The alternate route program is a replacement for teacher preparation, serving teachers who have completed a bachelor's program with an academic major but who have not yet earned a teaching certificate.

Although experienced teachers play a central role in both programs, the scope of their responsibilities differs. In the induction program, "support teachers" are released from classroom responsibilities to work full time with 12 to 14 new teachers. In the alternate route program, "mentor teachers" spend at least 60 percent of their time as classroom teachers. Typically they work with 1 to 4 novices teaching in the same school or in a school nearby.

To get some picture of what support teachers and mentor teachers do and how they think about their work, we spent a day following individuals as they worked with beginners. Usually this meant going with an experienced teacher to observe a lesson and then sitting in on a conference between the experienced and beginning teacher. Sometimes it meant observing conferences between experienced teachers and beginning teachers independent of a classroom observation. We even accompanied a novice and support teacher on a visit to another teacher's classroom. In every case, we interviewed the experienced teachers before and after each session, probing the reasons behind their statements, questions, and actions, and exploring their views about what their beginning teachers need to learn and how they could best be helped to learn that.

As we expected, subject matter concerns were indeed part of the conversations that experienced teachers had with beginning elementary and secondary teachers; however, the way the subject matter entered the conversation and the treatment it received differed. We rarely heard experienced and novice teachers speak directly about the meaning of the content itself, though this clearly required attention in some cases. We did hear them talk about subject matter in relation to students' thinking and understanding, and in relation to classroom organization and management. In some of these conversations, subject-specific concerns were focal, while in others, subject matter was simply a given, part of the sentence, but not something to probe or question.

To illustrate these differences, we present four examples of conversations between experienced teachers and beginning teachers, two from the induction program and two from the alternate route program. We deliberately include two subject areas--math and language arts/English--taught at both the elementary and secondary levels. Each example is followed by a brief commentary highlighting the

place of subject matter in that particular conversation. The concluding section of the paper looks across the four examples, comparing and contrasting how well they attend to different aspects of learning to teach academic content.

### **Frazer and Frank**

A 30-year veteran of teaching, Frazer is a support teacher in a teacher induction program. On this January morning, he begins his rounds with an 8:00 a.m. meeting at an inner-city school. Frank, a beginning teacher, has asked for help in teaching multiplication to his third graders.

Frank is confused about what the numerals in a multiplication problem represent. In a single digit problem (e.g.,  $3 \times 2$ ), which number stands for the number of sets and which for the number of items in each set? "When I look at the math book," he said, "it's flip flopped. . . . If it's written vertically, it wouldn't be 3 groups of 2. . . . The way they break it up as 2 groups of 3, that's the way I see it. . . ." Frank talked to the district math consultant who suggested that he simply translate the multiplication sign to mean "groups of," but Frank wants to talk with Frazer about the conflicting advice he got from the textbook. He has also asked Frazer to spend some time working with a small group of students who have been having trouble with multiplication. Students have been doing mostly "skill and drill" work, but Frank isn't sure they understand.

On the way over, Frazer describes his expectations for the session to the researcher:

I don't have a very specific goal except that both of us will think more about what are we trying to get kids to understand when they multiply and what kind of sense can eight-year-olds make and what kind of manipulatives can we use to help [them] make sense of that.

### **The Conference**

Frazer does not arrive at school empty-handed. He brings a book for Frank, *How Children Learn Mathematics* by Richard Coplin, and a bag of small game pieces and rubber bands which he plans to use "to help kids get the idea of separating sets of things." During the conference, he sets up three cubes in two rubber bands, explaining: "These [pointing to the rubber bands] define the sets . . . so that the rubber band really goes with the word 'sets,' two sets of three."

Frank plays around with the cubes, trying to clarify the difference between  $3 \times 2$  and  $2 \times 3$ , and explaining why the math consultant's advice doesn't work for him.

I have a hard time accepting just one set way that the math department wants to do it, at this point, because to me, if children want to reverse it or something so it is more easily understandable, I think that is fine.

When Frazer asks what the implications of this stance are for his teaching, Frank says he will stick to the math consultant's way because it probably "comes from research and maybe this is how generally children learn." At this point, Frazer pulls out the Coplin book and suggests that Frank might want to read the section on multiplication and division and they can talk about it.

Then Frank tells Frazer his plan for how they will work with students. He will take four students to the listening center while Frazer works with four students in the typing area. "You can just talk a little about multiplication, ask them how they feel about it," Frank explains. "Do you want me to tell you what I'm going to do?" Frazer asks gently and Frank listens eagerly as Frazer describes how he will use the cubes and rubber bands to help students represent the times tables, modeling what he will do and say:

First we'll do the ones. This [pointing to a rubber band] is one group of none. Zero. Not any. One group of not any. . . . And then, we'll go on to the two's and put two groups, and then if time permits and some of them are ready and they sense the pattern I'll say, "OK now you can just go on, on your own." And I'll watch them and see when they need help and some of them can go on to three and just write and set up each of the times tables as far as we have time.

When Frazer offers to share the materials, Frank quickly accepts, abandoning the ditto sheet that he had prepared for students to use. "I put out a worksheet that just has some multiplication problems on it, but I don't think we're going to need it. I like your idea of just taking it sequentially and I'm going to use that, too." After morning exercises, Frazer spends about 15 minutes with his small group, then leaves for a 10:00 a.m. appointment.

### **The Debriefing**

In a debriefing session, Frazer explains to the researcher that he did not necessarily intend for Frank to "do it that way," though he wanted him to know about the strategy of using game pieces and rubber bands which he had used successfully with third graders. The brief co-teaching episode will provide a basis for talking concretely with Frank about how different students make sense of the mathematics:

I'll be interested to see how far Frank and his students went with it, how clear their understanding of it was as evidenced by the written work. . . . I'll be interested to see and to think with him about the diversity of their abilities.

## **Commentary**

Subject matter concerns figure prominently in this conversation. Frank's questions and comments reveal a shaky understanding of multiplication and a reliance on algorithmic approaches to teaching it ("skill and drill"). Instead of dealing directly with Frank's confusions, however, Frazer concentrates on how to help students understand what multiplication entails. By showing Frank a concrete way to represent the multiplication algorithm (using small game pieces and rubber bands), he indirectly contributes to Frank's subject matter understanding while directly enlarging his instructional repertoire. He focuses Frank's attention on how individual students make sense of the content and creates an occasion for him to continue learning about multiplication and the teaching and learning of multiplication.

### **Sandy and Rachel**

Sandy is also a support teacher in a teacher induction program. On this January morning, she and Rachel, one of her beginning teacher clients, are going to visit another classroom to observe "writers' workshop" in operation. Sandy explains to the researcher that "Rachel has been wanting to pursue writers' workshop since day two, but now she's ready to see it in operation."

Sandy believes that beginning teachers need to "see demonstrations and talk about how things get set into motion." Although Rachel has read books by Donald Graves and Lucy Caulkins on the teaching of writing, she has "no conception" of what their approaches are supposed to look like. "Even from reading about it [writers' workshop]," Sandy explains, "you can't get any visual imagery about what the kids are going to be doing and what the teacher's role will be." She has arranged this classroom observation to give Rachel a concrete example of writers' workshop. Seeing this approach to writing in action will help Rachel clarify the many decisions she will have to make in implementing her own version. Rachel herself says that she wants to see the "logistics--how do you talk to students and give feedback on their stories, how students can feel good about the editing process."

Dirk, the third-grade teacher they are observing, tells the visitors to "be real nosy--walk around, ask the kids what they are doing, listen in on conferences [they have with each other]." The room has a relaxed feeling as students work on their writing or talk with their neighbors while the teacher meets with individual students at his desk. Sandy and Rachel wander around, making notes and asking students where they keep their work-in-progress and what happens to their finished pieces.

After noticing a student copying over a story full of corrections written in colored pencil, Sandy suggests they listen in on a writing conference between Dirk and a student. They watch as Dirk reassures a student not to feel badly because "this is always what happens when you write." Then he reads the student's story aloud, crossing out misspelled words and putting in the correct punctuation.

After going through half the story, Dirk tells the girl to copy the story up to this point. "We'll finish it in the next conference."

Off to the side, Sandy and Rachel discuss the pros and cons of having the teacher correct the story in front of the student. Rachel prefers to have students read their own story and circle their own comments. While she recognizes that this would make the conferences last longer, it would also give the student more responsibility. "I don't feel that I should be doing all the editing." Sandy agrees: "It's easy for teachers to give suggestions. In conferences, you have to let the child own the conference and that is hard."

The conversation turns to questions about spelling and punctuation. Rachel tells Sandy that she has students look up words in the dictionary but "it takes such a long time." Sandy points to a word bank on one of the walls and suggests that they find out when and how students use it. She also suggests that Rachel could incorporate into her spelling program words students have trouble spelling in their stories.

Sandy wonders whether Dirk talks with his students about the content of the story, "whether it makes sense." Students have a hard time "transforming a personal experience into a literary form," she observes. "That's where reading fits in. If you look at a story and find out whether it makes sense, you can make this connection between the kids' writing and the author's writing."

In their conversation, Rachel asks a lot of procedural questions such as what to do if students don't want to have conferences and how to teach punctuation. Sandy connects her questions to broader issues:

I found that if second graders read their story aloud and heard where there were pauses, they became aware of punctuation. Particularly if you showed them what other writers do to indicate how something can be read, this connection can be made explicit.

In the car on the way home, Rachel asks Sandy how she handles conferences. Sandy explains that she talks about the content first, showing students how to use an asterisk to insert new material. She also holds conferences with two to three students at the same time. Finally, she emphasizes to students that they should bring their best story to conference.

## **The Debriefing**

During the debriefing Sandy explains to the researcher that the next step is to sit down with Rachel and start planning how to organize and introduce writers' workshop. Will Rachel use writing folders? Where will the stories go? How will she handle conferences? How will kids know what to write about? Drawing on her experience teaching writing and her knowledge of Rachel, she highlights aspects that may be problematic for Rachel, for example, figuring out how to introduce the whole idea. Sandy has observed that Rachel tends to tell students too much too fast, so they will have to spend time figuring out what to say first and how to follow that up with appropriate demonstrations until Rachel is certain students know what she means and what they are supposed to do.

## **Commentary**

While the session mainly focuses on problems of organizing and implementing a writing program, subject matter concerns intermingle with Sandy and Rachel's talk about curriculum, instruction, and management. By observing together, Sandy can help Rachel think about the principles that underlie particular procedures. She describes some strategies for teaching punctuation (having students read their stories aloud, listening for the pauses, and showing students how professional writers use punctuation to indicate how they want their stories read) which instantiate the connections between reading and writing. From her own subject matter understandings, Sandy identifies principles and procedures important for Rachel to know in order to start writers' workshop in her classroom.

Sandy and Rachel not only discuss what they saw in Dirk's classroom; Sandy also describes alternative strategies she has used. She conveys the idea that writers' workshop is not a technology to put in place; rather, each teacher must clarify her own views about the teaching of writing and adapt the strategy to her particular students and classroom. Sandy's talk illustrates how knowledge of the subject intersects with knowledge about organizing and instructing students to learn the subject.

## **Craig and Brian**

In an interview before the session, Craig, an experienced teacher/mentor in an alternate route program, describes his concerns about Brian, a new high school math teacher with 18 years experience as an engineer. He thinks Brian needs to work on "wait time."

He needs to hear from as many students as possible. . . . Teachers tend to focus on the more vocal student or one who knows the material. It's like they are saying, "There's no room for wrong answers, and since you cannot answer promptly and correctly, just listen." But kids cannot learn by listening only. . . . Learning should be student-centered; those are the people learning. The teacher should be a guide there to help them.

As Craig enters the class, he sees students working on problems Brian has written on the board. Three of the problems deal with ratio and proportions and one asks students to identify corresponding angles and sides for two triangles. While students work at their desks, Brian and his aide circulate. When students say, "I don't know how to do this," as they frequently do, Brian reminds them what a ratio is or tells them how to solve the problem. After about 15 minutes, Brian goes over the problems at the board, calling on different students for answers and moving on when they cannot respond.

For the second half of the period, Brian works through an application problem from the textbook--finding the distance from the top of a tree to a point on the road. Brian draws a picture on the board and questions students: "What does the guy want to do? Why? What do we know from this drawing?" As he goes through the problem, suggesting different solution strategies, about half the students begin to do the calculations or suggest next steps.

When they finish, Brian asks, "Is this answer a reasonable value? Is the shadow longer or shorter? Should it be longer? And should the tree appear longer than the shadow?" Only a few students respond with a "yes" or "no." Finally, Brian gives students a similar problem for homework.

### **The Conference**

For the next 20 minutes, Craig and Brian talk about the lesson. Craig begins with open-ended questions: "How do you feel about the lesson? Did you enjoy it? What are your impressions?" The questions elicit considerable frustration from Brian who feels that the students don't want to pay attention, aren't interested, only want the formula and don't care about applying the formula to real-world problems.

After a while, Craig tries to refocus Brian's attention on student understanding and teacher responsibility. "So even though your students do the problems, they don't understand. Now what do you do?" When Brian shrugs, Craig points out that the students "depend on you and the aide telling them what to do" and advises Brian to "give them opportunities to do the problems themselves, make them take responsibility."

Only you worked the problem . . . and you didn't have time to see them even try one. You need to force them to understand. Ask them to find a new proportion and define what is a proportion. . . . By doing this, you see if students understand the basic technology and the concept. You create a situation where a kid must *understand* in order to answer.

Brian sighs and begins to complain about the textbook. Craig points out that the textbook is only one resource. "Don't let the book frustrate you. You just teach from your subject matter

knowledge." Craig tells Brian that he goes outside the textbook to make up his own problems. In response to Brian's statement that students don't take notes, Craig describes how he requires students to keep a notebook where they copy sample problems and do their homework which must be signed by a parent. He also uses the notebooks to compile grades and get at student understanding by having students point out particular problems they don't understand. "So the notebook provides another way for you to pay attention to what students understand."

Craig tries to get Brian to examine his own behavior by asking, "What would you say about your attempts to reach students?" When Brian says he tries, Craig asks a more pointed question: "Who do you call on?" He suggests that Brian think about cooperative grouping strategies. When Brian points out that he lets students work together, Craig counters: "Someone could give you answers, but that doesn't mean you understand the subject matter. Students won't know they don't understand if they don't try it." Craig suggests that Brian have students who understand the content work with those who do not. That way "each student's knowledge of subject matter is enriched, and you ensure activity and no student boredom, the lack of which could lead to management problems." The conference ends with Craig suggesting they continue talking about cooperative grouping methods.

### **The Debriefing**

After the conference, Craig tells the researcher that he began with Brian's feelings because he wanted to start with "the teacher's perspective, what was most on his mind." Through his questions and the "scripting of the lesson"--writing down Brian's behavior and interactions--Craig planned to lead Brian through the lesson, looking at particular things that frustrated him. Most of all Craig wanted to push Brian to think more about individual students' understanding. The strategies he suggested would help Brian "build a pool of information and choose the alternatives he is most comfortable with, and then we will build from there." When the researcher asks Craig what he would do if none of the strategies worked, he says he'd ask Brian, "I need help from you. We have to make an improvement. Now what is it that you suggest we do?"

### **Commentary**

Concern for students' understanding and involvement frame the way Craig looks at and talks about Brian's teaching. Craig wants Brian to create opportunities for students to work through the problems for themselves. Besides contributing to student understanding, this will enable Brian to find out how students are thinking about the content. Craig suggests various strategies for accomplishing these goals--having "better" students work with weaker students, requiring students to keep a notebook, "making" students do the problems.

Craig also believes that Brian should teach from his subject matter knowledge, using the

textbook as one resource. Clearly Brian knows a lot of math. The question is whether he can translate this understanding into the kinds of learning opportunities that will engage students in meaningful learning of mathematics. The strategies that Craig suggests, however, do not help Brian think concretely about getting students to see the value and meaning of particular mathematical topics or expand his repertoire of application problems that may engage students.

### **Lila and Clark**

Lila, a mentor teacher in an alternate route program, leaves a substitute in charge of her fifth- and sixth-period classes so that she can observe Clark, a beginning English teacher, working in a nearby junior high school. She arrives in time for the opening activity--copying sentences and correcting punctuation and capitalization errors. A common practice in the district, such opening activities are designed to engage students in an academic task while the teacher takes roll.

As students finish their sentences, the noise level rises. Clark reviews the sentences, calling on students to verbalize the corrections. Then he turns to the main activity of the period--completing the reading of "Will Stutely's Rescue," a Robin Hood tale that the class has been reading. Clark asks students some recall questions ("What happened yesterday when we read?" "What happened when Will went to the Friar's pub?") and ends up actually retelling the story himself.

For the next 30 minutes, Clark and the students read the story aloud. Clark stops every few paragraphs to question students about what is happening. As the period progresses, students become restless and most stop following along. With 10 minutes left in the period, Clark stops the reading and assigns students to define and write sentences for 10 words taken from the story.

### **The Conference**

After class, Lila and Clark meet for a half hour in the teacher's lounge to talk about the lesson. Lila takes the lead, raising most of the topics. She focuses on three main issues: the opening activity, the reading of the story, and a question Clark asks students at the end of the reading phase of the lesson.

Lila thinks that students entered and remained too noisy and unsettled during the period. She points out that when students continued talking, Clark simply raised his voice. "Don't talk over kids and don't recognize kids calling out responses to the dispatch [the opening activity]," she advises. Clark defends himself, saying that students were coming from lunch and some were generally "just very hyper kids." Interrupting Clark, Lila suggests that "maybe the dispatch should be reading a novel for 10 minutes. You could take them to the school library and get them novels to read. Each student should have one."

Next, Lila focuses on the story reading. She praises Clark for stopping to review the plot and compliments him on how well he projects his voice. Still, she thinks the language of the text is too

difficult for these students and suggests that Clark look for an easier version. She also advises Clark to have *students* paraphrase the story. "You don't have to do it all." Lila believes that, in every English class, the time should be equally divided among reading, writing and speaking. "Your class should not be so one-dimensional. There should be some reading, speaking, and writing skills divided equally throughout the period."

Lila spends the remaining minutes of the conference on a question Clark had posed at the end of the reading: "Should Robin Hood be taking from the rich to give to the poor?" She suggests that Clark use it as the basis for a journal entry, but Clark says he plans to start the next class with a discussion, asking: "What might happen if Robin Hood lived today? Would it be okay to take from the rich?" He hopes these questions will help students connect the story to their own lives. Lila expresses concern about the kinds of connections students might draw. "In reality," she says, "some people are richer than others, and students need to realize that reality even though they may not like it." As the conference ends, Lila and Clark plan to meet again in five days.

### **The Debriefing**

In the debriefing with the researcher, Lila elaborates on her concerns about the version of the story, the question Clark posed, and the difficulty of leading a good discussion with his students. She is especially worried that the students will miss the moral dilemma posed by Robin Hood's actions and respond only from their own experiences:

Is it okay if somebody is rich to take his money just because he's rich? These kids can relate to that because many of them do come from low-income homes. Might they think it is okay to knock on their neighbor's door or barge in and take something just because the neighbor has more?

Lila repeats her concern that the difficult text causes discipline problems. "If you can't understand something, if he's talking Greek and you don't know Greek, at our age, you're just going to drift off. At their ages, you're going to get into trouble." Finally she observes: "These kids are not very good at discussing." She thinks it would have been preferable for Clark to put the discussion questions on the overhead, pair the students off, and let them write answers to the questions. "That way they get practice in speaking skills while they're working together and that always works well."

## **Commentary**

Though present, subject matter concerns take a peripheral place in the conversation between Clark and Lila. Some of Lila's suggestions to Clark are rooted in subject matter understandings. Having students read a novel of their own choosing presents an engaging opening activity while giving students a chance for independent reading. Having pairs of students discuss and write answers to questions can involve more students in thinking about the story, while giving them a chance to write and speak. These suggestions are designed to increase student participation in academic tasks and produce a better balance among three major activities in the English curriculum--reading, writing, and speaking. Lila's knowledge, views, and experience teaching English provide the rationale for her practices. However, because she does not explicitly provide Clark with a justification, he may see her suggestions only as matters of personal preference.

Lila's concerns about Clark's discussion question may stem from her subject matter and pedagogical knowledge about what a good discussion would entail. However, she does not help Clark think about the substantive issues and how they interact with the teaching task (leading a good discussion). What moral considerations does the question raise? What factors should students take into account in evaluating Robin Hood's deeds both then and now? What connections does Clark think students could make to the story and for what purposes? Talking about questions like these would involve Clark and Lila in a subject-specific discussion that could deepen Clark's understanding of what the story means and what his students could learn from it. These kinds of understandings are prerequisites for leading a good discussion of the question.

## **Discussion**

In all these examples, experienced teachers are helping beginning teachers who, in turn, are trying to help their students learn specific academic content. Looking across the four cases, we see striking differences in how the experienced teachers treat subject matter concerns, differences that affect beginning teachers' opportunities to learn. In this concluding section, we discuss these differences in relation to four aspects of learning to teach academic subjects: (a) deepening ones' own understanding of subject matter; (b) learning to think about academic content from the students' perspective; (c) learning to represent subject matter in appropriate and engaging ways; (d) learning to organize students for the purposes of teaching/learning academic content.

### **Deepening Novice Teachers' Subject Matter Understanding**

Subject matter understanding is a *sine qua non* in teaching. To help pupils learn worthwhile academic content, teachers have to know the content themselves. This is especially true when they seek to foster conceptual understanding. Contrary to popular belief, many beginning teachers have not had adequate opportunities to learn their teaching subjects *before* they begin teaching (see Ball, 1988; McDiarmid, 1989; Schram, Feiman-Nemser, and Ball, in press). The probability that they will do so during their first year of teaching without some kind of assistance is slim.

The conversations reveal a range of ways to deal with beginning teachers' own subject matter understandings. They include presenting subject matter knowledge directly (Sandy), contributing to subject matter understanding indirectly (Frazer), assuming adequate subject matter knowledge (Craig), and ignoring subject matter understanding (Lila).

Although not a central concern, Sandy contributes directly to Rachel's subject matter understanding by incorporating specific knowledge about writing into the conversation. For example, she explains that writers use punctuation to indicate how they want their stories read and she talks about writing as a purposeful activity that should "make sense." Frazer also contributes to Frank's subject matter knowledge, but he does so indirectly by giving him a book about how *children* learn mathematics and by showing him a concrete way to help students understand the concept of multiplication.

In keeping with the assumption undergirding alternate route programs, Craig takes for granted that Brian knows enough mathematics. "Teach from your subject matter knowledge," he tells him, "not only from the textbook." Knowing mathematics for purposes of teaching differs from simply knowing mathematics. As we shall see below, Brian still needs help in thinking pedagogically about mathematics.

The case of Lila and Clark is different. Here it seems that Lila misses an opportunity to encourage deeper thinking about the Robin Hood tale and the moral issues it raises. How will Clark know which points to emphasize or when the discussion is going astray if he hasn't thought through the question?

### **Learning to Think About Subject Matter From the Student's Perspective**

In learning to teach academic content, beginning teachers must learn to think about subject matter from the students' perspective. Among other things, this means figuring out what is to be learned and paying attention to student thinking and understanding. Mentor teachers can help novices develop the requisite understandings and dispositions by focusing on the intersection between subject matter and student thinking. The conversations between Frazer and Frank and between Craig and Brian illustrate two different treatments of this issue.

Frazer treats students' thinking about and understanding of multiplication as a *process* to study.

As he explains to the researcher, his goals are to think with Frank about what students need to understand when they multiply and how individual students make sense of multiplication. Craig treats student thinking and understanding as an *outcome* to promote through appropriate teaching strategies. As he tells Brian, you have to "force" them to understand by "making" them do the problems. In order to produce such an outcome, however, Brian needs to know what such an understanding entails. It seems likely that Frazer's approach can foster the habit of viewing subject matter in relation to students' thinking which Dewey (1904/1965) argued was the distinguishing mark of a good teacher.

### **Learning to Represent and Present Academic Content**

While subject matter knowledge is indispensable in teaching, it does not automatically yield ideas about how to represent or present specific content to particular students. For this, teachers need another kind of subject specific knowledge, a special blend of content and pedagogy that Shulman (1987) has labeled "pedagogical content knowledge." Pedagogical content knowledge includes useful ways to conceptualize and represent commonly taught topics in a given subject (Wilson, Shulman, and Richert, 1987).

Good experienced teachers know how to translate their disciplinary understanding into appropriate explanations and tasks for students. They can help beginning teachers learn how to enact the curriculum by sharing and appraising ideas that have worked for them and by guiding novices in generating their own representations. In this way beginning teachers will not only expand their instructional repertoire, they will also learn to appreciate the relevant considerations.

All four mentors share ideas from their own teaching, but only some of these ideas involve ways to explain or represent specific content. The clearest examples come from the elementary teachers--Frazer's model of multiplication and Sandy's explanation of punctuation. While Craig tells Brian that he makes up his own mathematics problems, he does not share specific examples in this conversation or talk about what makes a good problem.

### **Learning to Organize Students for the Teaching/Learning of Subject Matter**

Besides learning to represent and present content, beginning teachers need help learning to organize students for purposes of teaching and learning. This involves establishing appropriate routines and procedures, communicating clear expectations, managing different types of tasks and activities and so on. The conversations between Sandy and Rachel and between Lila and Clark illustrate two different treatments of subject matter in relation to management concerns. In the first example, talk about management and organization is rooted in the specifics of content. In the second, the references to content remain at a more general level.

In talking with Rachel about teaching writing, Sandy blends subject-specific, procedural advice

with discussions of subject-specific principles. Whereas Dirk, the teacher Sandy and Rachel observed, seems to use writing conferences to edit student work, Sandy perceives them as opportunities to help students become critical readers of their own texts. Her advice about how to organize writing conferences reflects her position on the issues of ownership and purpose in writing.

Sandy also knows that the way Rachel introduces the program will determine whether students understand what they are supposed to do. Therefore, she plans to help Rachel figure out how to organize students for writing, clarify the rules and procedures that will govern writers' workshop, and even decide how she will introduce the program. In all this planning, concerns about order intermingle with concerns about content and pedagogy as Sandy helps Rachel understand the practical and intellectual dimensions of writers' workshop (Carter and Richardson, 1989).

Lila also gives Clark suggestions about teaching English; however, her advice is general. Knowing that a good opening routine can solicit students' attention and contribute to an orderly class, she urges Clark to try a different dispatch activity--having students read a novel of their own choosing for the first 10 minutes of class. Based on research on effective classroom management, dispatch activities are widely used throughout the district, not only in English classes. Based on a general principle about English curriculum--that each class should have a balance of writing, reading, and speaking activities--Lila's tactical suggestions serve an instructional and a management goal.

Craig's recommendation that Brian use cooperative groups to avoid student boredom and management problems occupies yet a third position on the continuum. Unlike Sandy's advice which reflects specific concerns about writing and Lila's advice which relates generally to English, Craig's advice is content-free. It is unlikely that Brian will be able to act on this advice without further discussion about how to organize and monitor cooperative groups and about the kinds of mathematics problems that would be appropriate for this format.

As the conversations and this discussion make clear, subject matter concerns permeate the tasks of teaching. When experienced teachers talk about the particulars of content in their work with beginning teachers, they provide rich opportunities for novices to learn to teach academic content. They also challenge the analytic distinctions between content and pedagogy, and management and instruction that researchers have foisted on the field and highlight an important consideration in the curriculum of programs for beginning teachers.

## References

- Ball, D. (1988). *The subject matter preparation of prospective mathematics teachers: Challenging the myths* (Research Report 88-3). East Lansing: Michigan State University, National Center for Research on Teaching.
- Brophy, J., and Good, T. (1986). Teacher behavior and student achievement. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (3rd ed.). New York: Macmillan.
- Carter, K. and Richardson, V. (1989). A curriculum for an initial year of teaching program. *Elementary School Journal*, 89, 405-421.
- Dewey, J. (1965). The relation of theory and practice in education. In M. Borrowman (Ed.), *Teacher education in America: A documentary history*. New York: Teachers College Press. (Original work published 1904)
- Doyle, W. (1986). Content representations in teachers' definitions of academic work. *Journal of Curriculum Studies*, 18, 365-379.
- Feiman-Nemser, S., and Buchmann, M. (1987). When is student teaching teacher education. *Teaching and Teacher Education*, 3, 255-273.
- Huling-Austin, L., and Murphy, S. C. (1987). *Assessing the impact of teacher induction programs: Implication for program development*. Paper presented at the annual meeting of the American Educational Research Association, Washington, D.C. (ERIC Document Reproduction Service No. 283 779).
- McDiarmid, G. W. (1989). *What do prospective teachers learn in their liberal arts courses* (Research Report 89-8). East Lansing: Michigan State University, National Center for Research in Teacher Education.
- Odell, S. (1986). Induction support of new teachers: A functional approach. *Journal of Teacher Education*, 37, 26-30.
- Odell, S. J. (1989). Developing support programs for beginning teachers. In L. H. Austin, S. J. Odell, P. Ishler, R. S. Kay, and R. A. Edelfelt (Eds.), *Assisting the beginning teacher* (pp. 19-37). Reston, VA: Association of Teacher Educators.
- Schram, P., Feiman-Nemser, S., and Ball, D. (in press). *Thinking about teaching subtraction with regrouping: A comparison of beginning and experienced teachers' responses to textbooks* (Research Report 89-5). East Lansing: Michigan State University, National Center for Research in Teacher Education.
- Shulman (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, 57, 1-22.

Veenman, S. (1984). Perceived problems of beginning teachers. *Review of Educational Research*, 54, 143-178.

Wilson, S. M., Shulman, L. S., and Richert, A. E. (1987). "150 different ways" of knowing: Representations of knowledge in teaching. In J. Calderhead (Ed.), *Exploring teachers' thinking* (pp. 104-124). Eastbourne, England: Cassell.