Critical Experiences in GMTAs' Discussions Regarding Teaching

Jason K. Belnap

Brigham Young University

Michelle Giullian Withers

Brigham Young University

Final draft: Submitted to RUME 2009 Proceedings

Background

Contemporary approaches to the professional development of teachers–by which I mean all instructors including K-12 teachers (preservice and inservice) and college teachers (faculty, lecturers, and graduate teaching assistants)–include a wide range of activities and methodologies (Carter & Anders, 1996; Sherin, 2000; Sherin & Han, 2004; Stengel & Tom, 1996; Levine, 1996; Belnap & Allred, 2006b; Knowles & Cole, 1996). Some of the approaches and pedagogies commonly utilized in K-12 teacher preparation include: video clubs (Sherin, 2000; Sherin & Han, 2004); microteaching (Fernandez, 2005), minicourses, seminars (Carter & Anders, 1996); apprenticeships, case discussions (Carter & Anders, 1996; Levine, 1996); problem-based discussions (Levine, 1996); field experiences (Carter & Anders, 1996; Knowles & Cole, 1996); and methods (and other) courses (Stengel & Tom, 1996). Some of the approaches and pedagogies that Belnap and Allred (2006b) found commonly used by college mathematics departments to prepare graduate mathematics teaching assistants (GMTAs) included: case discussions, course meetings, and both formal and informal teaching discussions.

In spite of major differences among these programs, many of the pedagogies and methods employed by them have one thing in common; they depend upon discourse among the participants. They rely upon participants' abilities to carry on discussion regarding teaching, whether the content involves lesson planning, student responses/behaviors, pedagogy, student understanding, or any other aspect of teaching. Thus, the effectiveness of many of these approaches depends in part upon participants' ability to contribute productively to discussions on teaching (i.e. how empowered they are to engage in these peer discussions).

There are many things that enable teachers to contribute to discussions with their peers, regarding teaching. Belnap and Withers (2008b) found that these included personal resources and social elements. Some of the personal resources that enable them include: a)

specific experiences they have had in the classroom; c) discussions with other teachers; d) general concepts developed over time regarding teaching, teachers, learning, and students; and e) related views, beliefs, and assumptions (Belnap & Withers, 2008b). Teachers are also enabled by the extent to which they can change their perspective, seeing things from the perspective of their students. Finally, the social context itself can empower them, namely program structure and similarities/differences among participants.

Although teachers draw upon various personal and contextual elements in order to participate in discussions regarding teaching, personal experiences have special significance and weight. Studying the discussion from one professional development program, Belnap and Withers (2008b) found that participants relied upon personal teaching-related experiences far more than anything else when contributing direct content to discussions. Participants relied upon their personal experiences to illustrate, explain, support, and justify ideas; in these ways, they provided critical structure for the discussions that developed and a substantial portion of their discussions' content (Belnap & Withers, 2008b).

If personal experience is so central to discussion on teaching, then understanding these experiences is critical to knowing how we can access them to make discussions more productive. This raises several questions, which we intend to address in this paper: what types of experiences empower teachers to contribute to discussions on teaching? and what characteristics of experiences make them important to discussants and useful contributions to discussions?

Literature and Theoretical Framework

Our theoretical perspective, illustrated by figure **??**, draws upon common theories of learning, such as constructivism (Cobb & Yackel, 1996; Zevenbergen, 1996), the sociocultural perspective (Cobb & Yackel, 1996), socioconstructivism (Cobb & Yackel, 1996), and agency (Walter & Gerson, 2007). We assert the existence of both social and individual

knowledge. Individuals actively construct their own knowledge and understanding from their experiences; this happens as they make intentional and willful choices within social contexts; and through these actions they both influence and are influenced by the norms of practice of the community in which they participate. Thus the local affects the global and visa versa.

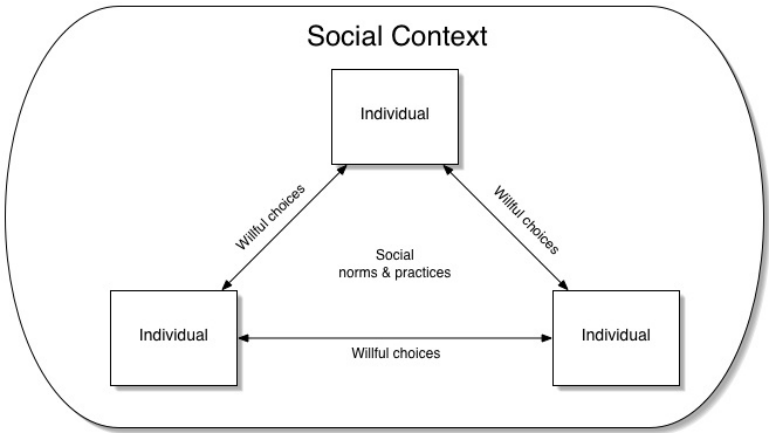

Figure 1. Theoretical Perspective

Our Perspective on Discourse

Discourse is social activity in which individuals interact via discussion; these discussions provide opportunities for individuals to construct knowledge through dialogue. Individuals construct knowledge as they contribute via questioning, explaining, synthesizing, and negotiating. Individuals exercise their agency as they choose their interactions (Walter & Gerson, 2007), intentionally choosing when to speak or withhold, what to ask or say, and deciding what and how to assimilate or accommodate into their cognition.

Conversely, these choices shape the content and nature of the discussion in a variety of ways. Through participation, individuals contribute to a growing text, representing the cumulative ideas and spoken content of the conversation. Each person's contribution can add, modify, clarify, justify, invalidate, or qualify the content and message of others'

contributions (Belnap & Withers, 2008a).

Through participation, individuals also establish and negotiate roles and participation norms. Each individual's contribution expects or responds to other contributions (Nassaji & Wells, 2000; Truxaw & DeFranco, in press; Wells, 1996) and affects the nature of the discourse, making it *univocal*, focusing on accurate transmission of a message, or *dialogic*, focusing on the co-construction of meaning (Truxaw & DeFranco, in press). Contributions can also invite further contributions, thus opening the discussions, or repress further contributions, contracting the discussion (Mesa & Chang, 2009).

Thus, discourse involves the mutual development of individual cognition and the supporting social context. Consequently, it is shaped (in part) by what individuals bring to it and choose to contribute. In a recent study of discussions among teachers in a professional development setting, we identified a variety of things that teachers utilized in order to contribute to discussions with their peers regarding teaching (Belnap & Withers, 2008b). Foremost among these were their classroom experiences, experiences they had in formal classroom settings.

Impact of Personal Experience

The classroom experiences arising in the discussions that we are studying represent participants' actual firsthand experience. Firsthand experience in teaching and learning settings has been known to strongly influence teachers' development. Researchers have shown that such experiences are powerful at shaping teachers' practices, views, and beliefs (Lortie, 1975).

One example of this is the *apprenticeship of observation* (Lortie, 1975). Long before future teachers enter the profession, before their preservice experience, and even prior to choosing to become a teacher, personal experiences begin shaping and influencing the teachers that they will become. Prior to their preservice instruction, teachers have had over 12

years of personal experience as students in the classroom, known as the *apprenticeship of observation* (Lortie, 1975). The apprenticeship of observation starts from from their first day of instruction and continues for as long as they are students; as students, they have the ability to see different teaching methods and formulate their own ideas about what constitutes good teaching (John, 1996). While it is not an apprenticeship in the typical sense, it still provides the student interactions with a teacher in practice (Lortie, 1975).

The apprenticeship of observation is one of the more powerful influences in teacher training (Borg, 2004; Lortie, 1975); this is because it is personal, firsthand experience. Students tend to trust their own experiences more than they do the research and ideas presented to them about teaching; in fact, this continues after they are no longer students (Lortie, 1975).

Although influential in teacher development, the experiences that make up the apprenticeship of observation are biased in two major ways. First, they provide an incomplete perspective on teaching. Lortie (1975) compares teaching to a stage, where the students see the performance, but are not privy to the preparation, intentions, or thoughts of the teacher; students get an incomplete perspective on the choices and repercussions regarding teaching. The second problem bias comes from students' personal (firsthand) involvement in the class; being the recipients of teaching creates a very personal connection. As students, they are focused on how the experiences impact *them*, not how the teacher utilized or implemented pedagogical approaches; they are unaware of the classroom dynamics. This personal connection introduces an affective component to the experience; Lortie (1975) states that children have not yet acquired sufficient emotional experience to make accurate empathetic attributions. What the students remember, more than the content, is the personality of the teacher (John, 1996). When experiences are based solely on affect and the personality of the experience, and not on pedagogical aspects, students are likely to come to incorrect conclusions regarding teaching (Lortie, 1975). Thus the apprenticeship of observation consists

of powerful, but biased (or powerfully biased) personal experiences.

Judging by the power that the apprenticeship of observation has on teacher development and noting their personal significance, it is not surprising that GMTAs, in the professional development setting, would draw upon them frequently. We must ask, though, is the apprenticeship of observation the coup de grace of personal experience? We are again led to our research questions: what types of experiences empower teachers to contribute to discussions on teaching? what characteristics of experiences make them important to discussants and useful contributions to discussions? and how do these characteristics impact the nature of the discussions?

Methodology

This paper reports on results arising from the Video Observations with Peer-feedback Session (VOPS) study. Taking place in a Mathematics Education Department in the College of Science at a large western university, the VOPS study was a longitudinal, qualitative study centered around the development of the VOPS program (described later); the VOPS study aimed at understanding this discourse-based program and the discussions that resulted.

Departmental Context

In the hosting department, all full-time graduate students were supported with teaching assistantships; because their responsibilities are typical of those in mathematics departments across the country (see Belnap & Allred, 2006a), we referred to them as graduate mathematics teaching assistants (GMTAs).

The department typically had eight to twelve full-time GMTAs per semester, four to six of which were in their first year. GMTAs typically taught their own class or ran two or three lab sections for a large lecture course; course assignments included College Algebra,

Trigonometry, Calculus, or the content courses for Elementary Education students.

The two major differences between GMTAs in this department and those in mathematics departments across the country were their teaching and degree backgrounds. All GMTAs in the department come with an undergraduate degree and/or certification in education. This means that they have experienced methods courses, have observed instruction, and have had field experience in the K-12 school system. Most bring with them a year or more of K-12 teaching experience. Additionally, because they are in the department's masters of mathematics education program, they: (a) attend courses and seminars on mathematics education research; (b) observe classes they will teach; and (c) after a year, begin conducting research in the field. They do this while concurrently serving as GMTAs.

We considered this pool of GMTAs an ideal group for study because of this differentiated background. By this we are not implying that they are excellent or effective instructors. We would expect that their knowledge and experience regarding teaching and discussing teaching would be more extensive than most GMTAs; consequently, we could look at this type of group as ideally prepared to participate in a discourse-based professional development program.

The VOPS Program

The Video Observations with Peer-feedback Sessions (VOPS) program, initiated Fall Semester 2006, was designed to support participants in their teaching development. The main objective of the VOPS program was to provide participants with ongoing professional development, closely tied to their current teaching experiences, but without significant increase to participant workloads. We aimed at doing this in a discussion environment, with low pressure and accountability.

Designed to meet the main objective, the VOPS program consisted of weekly sessions where participants discussed teaching, using actual classroom video footage as a catalyst,

a variation of Sherin's Video Clubs (Sherin, 2000; Sherin & Han, 2004). Unlike Video Clubs (Sherin, 2000; Sherin & Han, 2004), the VOPS were held on a weekly basis. Each week, GMTAs met for a 50 minute session in which they would view clips from each others' classes and use them as a basis for providing feedback and discussing other teaching-related topics. The typical session structure, which arose through negotiation with participants during the first two sessions, involved beginning with the volunteer providing background on the videotaped class. This was followed by a 15-20 minute video selection from that class. Participants used the remaining 25-30 minutes to discuss the clip, provide feedback, and talk about any other topic that arose.

At each session, a volunteer was chosen to be videotaped for a subsequent session. Each volunteer received a copy of their classroom videotape and was given the chance to select what segment(s) would be shown. Usually participants opted not to watch the video or select their own clips, citing time constraints; in these cases, the researcher (who was also facilitator) selected clips that were representative of what took place during the class.

In order to both provide the freedom for the exercise of personal agency and encourage participant involvement, the facilitator elected to minimize his own involvement. Because discussions were monitored or unfacilitated, participants controlled the discussions' content and flow. They were free to discuss anything they needed or desired and were not constrained to talk about the video clip; hence the clips were more of a catalyst for discussion and participants *did* discuss more general topics.

Participants and Participant Selection

The data on which this paper focuses comes from the semester that the VOPS program was piloted, Fall Semester 2006. Because the program was being piloted, participation in the program (and consequently the study) was voluntary. Five GMTAs, from the mathematics education department chose to participate that semester.

The five participants (all female and referred to as Ann, Liz, Lyndsay, Maud, and Sarah) were all full-time graduate students supported by teaching assistantships and pursuing a masters degree in mathematics education. They had similar amounts of prior teaching experience, some existing social connections, and diverse teaching assignments. Their offices were in close proximity; (Maud, Ann, and Sarah) shared offices; and (Liz and Lyndsay) shared the adjacent office. As shown in table 1, two participants were new GMTAs (in their first year as both a graduate student and GMTA); the rest were in their second year (as both graduate students and GMTAs); all participants had teaching experience prior to the study, including (with the exception of Sarah) K-12 teaching experience.

Table 1: Teaching backgrounds and current assignments of the Fall 2006 VOPS participants

	Prior Teaching Experience			Assignment
Participant	Duration	Type	Level	Fall '06
Ann [b]	1 year	Instructor	Middle School	Teacher—ME305
	1 year	Lab Instructor	College: Calculus	
Liz [a]	3 years	Instructor	Junior High	Lab Instructor—M110
	1 semester	Lab Instructor	College: Unknown	
Lyndsay [a]	3 years	Tutor	College	Lab Instructor—M119H
	1 year	Instructor	Middle School	
Maud [b]	1 year	Instructor	High School	Teacher—M10
	1 year	Instructor	College: Algebra	
	1 semester	Instructor	College: Calculus	
Sarah [b]	1 semester	Lab Instructor	College: Calculus	Teacher—ME305
	1 semester	Instructor	College: Calculus	
	1 semester	Instructor	College: Algebra	

Note: ME305 = First elementary education content course for elementary education majors, M110 = College Algebra, M119H = honors section of Business Calculus.
[a]Liz and Lindsay were in their first year as graduate students and teaching assistants.
[b]Ann, Maud, and Sarah were in their second year as graduate students and teaching assistants.

As also shown in table 1, the five participants had diverse responsibilities and class assignments during the semester of this study. Three of the five participants acted as the sole instructor for one class; two taught the first math content course for elementary

education majors (labeled El.Ed.1)–covering place value, integers, integer arithmetic, and geometry–and one taught a traditional course in College Algebra. Of the other two, one ran a lab section for a College Algebra course (grading, administering quizzes, and answering questions); the other assisted with a business calculus course (grading, holding office hours, and substituting occasionally).

Data Collection

Data collection spanned the semester. While data from observations, interviews, and written reflections were collected, observations of the sessions are the primary data source for this paper's analysis. We videotaped and transcribed each VOPS, utilizing the transcripts as data; video was utilized as necessary for clarification.

Overall, there were 11 VOPS during Fall Semester 2006. GMTAs took turns volunteering to be the focus of each session; even so, more sessions centered on Ann, Maud, and Sarah. This is because they were the sole instructor for their classes; being assistants, Liz and Lyndsay did not have instructional autonomy, therefore they did not usually know well in advance when they would be teaching or substituting verses administering quizzes. In fact, Lyndsay made special arrangements to teach so that she could volunteer to be videotaped.

Due to the time intensive nature of our different analyses of the VOPS program, we had to limit our present analysis to fours sessions. We chose the second, seventh, ninth, and eleventh (VOPS 2, VOPS 7, VOPS 9, and VOPS 11 respectively), in order to: (a) span the semester's progression, and (b) include a sessions where discussion focused on video from different volunteers and classes. Through these sessions, we could see their discussion at different times in the development of the program and see it when different teaching styles and classes were used as catalysts. For each of these sessions, table 2 shows from which class the video clip was taken, who was videotaped, and the date of the session; we will

refer to these sessions throughout.

Table 2: Class and participant volunteering for sessions included in this analysis.

Session	Class Viewed	Instructor	Session Date
VOPS 2	ME305	Ann	28 Sep 2006
VOPS 7	M110	Maud	2 Nov 2006
VOPS 9	M110	Maud	30 Nov 2006
VOPS 11	M119H	Lyndsay	14 Dec 2006

Note: ME305 = First elementary education content course for elementary education majors, M110 = College Algebra, M119H = honors section of Business Calculus.

Analysis and Results

To address the questions at hand, we conducted three basic levels of analysis loosely corresponding to our research questions. First, we conducted a coarse analysis aimed at identifying and typifying personal experiences. Second, we conducted a fine grained look at those experiences in order to understand their inherent characteristics. Finally, we looked at the breadth of characteristics of each experience type in order to better understand the nature of those experiences and infer their potential impact on discussions.

Personal Educational Experiences

In a prior study of VOPS 2, we (Belnap & Withers, 2008b) found that individuals' contributions were largely based on classroom experiences. These were participants' first-hand experiences within the classroom setting. During that study, we had noticed that there were different types of classroom experiences.

We began our current analysis by focusing on identifying and classifying all such experiences. Revisiting VOPS 2, we found all contributions previously coded as *classroom experiences*; these were contributions in which individuals referenced, described, or otherwise alluded to experiences they had had in classroom settings, regardless of their personal

role. Statements had been marked as such if there was clear reference to or evidence that the contribution was based on specific, relevant experiences—including repeated experiences. A coarse look at these experiences revealed three basic types of experiences, classroom experiences as: teacher, student, and observer.

in order to increase the number of contributions, for our more detailed analysis, we extended this analysis to VOPS 11. As we did, another type of experience emerged, tutoring experiences: both as tutor and tutee.

This analysis revealed a broader group of firsthand experiences, which we call *personal educational experiences*. Our typifying of these represent categorization along two dimensions: first, the academically created context; and second, the individual's assigned role in the experience. Classroom experiences represent formal learning settings, in which the overlying or dominant culture typically provides the distinct roles of teacher and learner; tutoring experiences represent less formal situations, in that the tutor/tutee distinction can be less defined by authority and credibility, being closer to a peer relationship. Differences in the individual's role in the experience contribute to differences in expected social practices. This includes whether the individual has responsibility as the primary knower or structurer of the experience (teacher or tutor), whether the individual was the primary learner or target of the instructional experience (student or tutee), or whether the individual had no direct responsibility in the class (observer).

Overall, our analysis identified five types of *personal educational experiences*: classroom experiences as teacher, student, and observer; and tutoring experiences as tutor and tutee. While we could conjecture the existence of tutoring experiences in which participants were independent observers, no such experiences arose in these sessions—it is unknown whether this is because the participants had no such experiences or because the experiences were irrelevant or unimportant.

Identifying Characteristics of Personal Educational Experiences

Once we had identified all personal educational experiences, we conducted a more detailed look at their characteristics, seeking to identify defining properties of the experiences that were evident in the text.

From our theoretical perspective, individual contributions represented willful actions regarding what to share or withhold, the exercising of personal agency. Therefore we assumed that when individuals shared or referenced experiences, their contribution included verbal cues for the properties of the experience that make it important or particularly relevant to the conversation; in other words, critical features of each experience were embedded in the statements made by the individual—especially because participants had control over the discussion.

So that our results would reflect the data, we used a Grounded Theory (Strauss & Corbin, 1998) and constant comparison approach to analysis. We began this process by looking at all personal educational experiences in VOPS 2 and VOPS 11. Because of contextual differences, we did not assume that the five different types of experiences would have the same characteristics. In fact, because one of the participant's classes was viewed and acted as catalyst for discussion, we separated those experiences that specifically came from that class, in case different characteristics arose from those experiences due to the program's structure itself.

We began our analysis with the contributions coded as *classroom experiences as student*. One-by-one, we studied each contribution in the context of its surrounding discussion; we then annotated each with phrases describing its important characteristics. Our focus was on textually or verbally supported features of each experience that made it powerful, memorable, or particularly useful; to do so, we asked ourselves questions, such as: What features of this experience would make it memorable or important enough for the contrib-

utor to share? and What about this experience makes it useful or relevant enough to the discussion for the presenter to share it? In doing so, we looked at both the text of the contribution and the way that the contributor expressed it, such as strong vocal expressions of emotion, evidenced by changes in the volume or enthusiasm of the presenter. We scrutinized our phrases by asking: are we speculating or is there supportive textual/verbal evidence?

Once we had annotated all contributions of that type, we clustered the statements by similar themes. These clusters were not mutually exclusive. Next, we studied each cluster, looking for common attributes and properties; we used these to form, define, and name categories. These categories represented key and defining characteristics of *classroom experiences as student*.

Following our analysis and coding of classroom experiences as student, we moved on to *classroom experiences as observer*, because it represented a very distinct participant role in the experience. Following the same process as above, we determined key characteristics (categories) of *classroom experiences as observer*. At this point, we compared the key characteristics of the observation experiences to the student experiences, looking for commonalities; as we did, we accommodated our categories, adjusting them to account for these similarities.

We applied this same recursive process to each of the experience types. Throughout the process, we reduced bias and improved validity by coding separately and negotiating differences until reaching a consensus. For each experience type, we first conducted an interior analysis through clustering, conceptualizing, and categorizing. Then, we compared the new categories to those formed from analysis of prior experience types, in order to identify common key characteristics. Finally, we took the resulting framework and applied it to two additional sessions (VOPS 7 and VOPS 9) to see if it held, making adjustments as needed. Throughout the process, we reduced bias and improved validity by coding

separately and negotiating differences until reaching a consensus.

Once we had completed this analysis, identifying key characteristics of all personal educational experiences, we conducted an axial analysis in order to identify features of each type of experience. To do this, we created a matrix crossing the five characteristics with the five experience types. We identified features of each type of experience by noting which characteristics appeared in contributions of that type. We then compared each of the types to see what features were common or different, making particular note to how they related to personal educational experiences as student, since these relate to the reviewed literature.

Key Characteristics of Personal Educational Experiences

Through our analysis, we found that many personal educational experiences had common characteristics. These key characteristics included: *class design*, *affect*, *impact*, *unexpectedness*, and *actor credentials*. Looking across experience types, we will illustrate and define each characteristic; we do this while providing an example of coding a segment of text, provided in table 3

The text in table 3 comes from VOPS 2, which revolved around video segments from Ann's ME305 class (the first content course for elementary education majors). In the viewed video, a student asked a question and Ann did not correctly understand the question or how to respond; instead of trying to understand the question, she went on without adequately addressing it. Immediately after viewing the clip, Maud initiated the discussion in table 3. The reader should be aware that Judith Warner was a faculty member that Maud had previously observed teach a class.

In L48, Maud initiates the discussion by drawing upon experiences she has had teaching. In her contribution, she references actual, repeated *classroom experiences as* a *teacher*, in which she has been asked questions by students, for which she did not know the answers. Her description illustrates four of the five characteristics: class design, affect, impact, and

Table 3: Segment of discussion from VOPS 2, 28 Sep 2006

Line	GMTA	Spoken Text
L48	Maud:	When I'm up in front and one of my students says something and I don't know the answer to it, but I feel like I have this obligation to sound smart. So I'm like, "Um," skirt, skirt, skirt, you know, instead of saying–
L49	Ann:	–I could have–what I should have done there was, "say it again," or, "did everyone understand that question?"
L50		Because I really didn't get what she said.
L51	Maud:	One time I saw Judith Warner responding to a student, like they said something and she's like, "Did anybody understand what they said, because I didn't understand?" And I thought, if Judith can do that, I could do that, so that's all I say.
L52	Ann:	Yeah.
L53	Maud:	"Can somebody else explain to me what they just said?"
L54	Lyndsay:	Yeah.
⋮	⋮	(*Discussion about being sensitive to students in doing this.*)
L61	Maud:	I mean, it's true. You do have to be careful,
L62		but it's hard sometimes. Like, you're standing up there and you just, like, don't understand what's going on and I don't know.
L63		I think teachers–
L64		–it's hard.
L65		I think that teachers should be viewed in a more human light than they are sometimes, like I'm not perfect, I don't do things exactly right.
L66	Ann:	Yeah, it's hard.
L67	Maud:	I mean for students who think that–like students think that, "Well, you know, you're the teacher; I'm relying on you for all this information," but–
L68	Lyndsay:	I would much rather have a teacher like take the time to understand what I was asking,
L69		because SO many times I ask someone or I notice someone ask something, and they just start going off, but they're not even answering the question–
L70	Ann:	And I did that a few times–

Note: GMTA = graduate mathematics teaching assistant

unexpectedness.

First, her account of the experience includes details regarding what transpired in the class. In this case, these details clearly present both a problem (not understanding students' questions) and one solution to that problem ("skirting" or evading a direct answer to the question). Some recounts of experiences include detail regarding what took place; we identified this characteristic as *class design*.

A second characteristic of her experience is *affect*, which we defined as emotion attached to the experience. We coded experiences as having affect as a characteristic when there were textual or verbal cues indicating emotion associated with the experience itself, not simply an emotional response to others' comments in the discussion. Maud indicates emotion when she says "feels like" or when she describes feeling a pressure to "be smart" which indicate emotion experienced during the event, *affect*.

Maud's description also includes textual indicators implying that she was personally affected by the experience. She describes a situation in which she was personally impacted; this is indicated when she says, "I don't know the answer to it, but I feel like I have this obligation to sound smart"; she is emphasizing that *she* was on the spot. We called this dimension *impact*; it is a characteristic of experiences whose textual descriptions indicate or illustrate how the experience impacted someone, some actor, in the recounted experience; most often, this emerged as a personal impact, first person; but there were rare cases of third-person impact.

Finally, from Maud's statement, "I don't know the answer to it," emphasizes the unanticipated nature of this experience. This is further indicated by her return to this in L62, when she says, "...don't understand what's going on". *Unexpectedness* does not, however, simply mean that the contributor did not anticipate something, but that the unexpectedness of the event was indicated textually by the contribution, suggesting that this characteristic made that experience stand-out or made it of particular notice.

Looking back at L48, Maud shared a *classroom experience as teacher* that is characterized (from her verbal cues) as having *class design, affect,* (personal) *impact*, and *unexpectedness*. Her reiteration of this in L62 still illustrates *affect, impact,* and *unexpectedness*, but lacks the descriptive detail of the context and solution provided in L48, so we would not code it as showing class design.

L51 shows another example; Maud presents another solution to the same problem, but illustrated by a specific *classroom experience as* an *observer*. Describing the experience, she saw a faculty member, Judith Warner, directly solicit the class to help her understand a student's question; this illustrates pedagogical detail in the form of a solution strategy that was part of the experience itself, *class design*. Common sense would say that this event was unexpected, but nothing in the text emphasizes that, so we did not code it as unexpectedness.

This experience highlights our fifth characteristic, *actor credentials*. In L51, Maud states, "if Judith can do that, I can do that". This indicates that this experience is important because of who did it, relying on the credibility of Judith Warner, an actor in the experience. Actor credentials represents some form of implied or stated authority that the contributor attached to the experience—credible to the individual, not necessarily referring to societal or academic credentials. So in L51, Maud shares a *classroom experience as observer* characterized by *class design* and *actor credentials*.

As a final example, in L69, Lindsay shares classroom experiences she has had as a student, in which she has asked questions or noticed others ask questions, which the teacher failed to address. This *classroom experience as student* illustrates: *affect*, frustration associated with the experience indicated by her vocal emphasis; *class design*, indicated by detailed description of the teacher's actions; and both first- and third-person *impact*, indicated by clear reference to how the experience impacted herself and other students. So these three characteristics make this experience stand out or make it personally relevant to

the discussion.

So, through our analysis, we found that personal educational experiences could be characterized by which of the five characteristics they exhibited through the textual and verbal cues of the contribution. A recounted personal educational experience exhibited: (a) class design, if it contained details regarding what transpired during the experience; (b) affect, if it referenced emotion attached to the experience; (c) impact, if it described someone being affected by the experience; (d) unexpectedness, if it emphasized the unanticipated nature of the event; and (e) actor credentials, if it derived importance from the perceived authority of a character in the experience.

Characterizing Features of Each Type of Personal Educational Experience

Most personal educational experiences could be characterized by the combination of the five experiences it exhibited. These played out differently depending on the type of experience; each type of experience appears to have a typical set of characteristics which may emerge when those types of experiences are recounted. Table 4 illustrates this, by showing which characteristics were manifest in those contributions.

Table 4: Characteristics Manifested in Personal Educational Experiences by Experience Type.

	Classroom Experiences as			Experiences as
Characteristic	Student	Teacher	Observer	Tutor/Tutee[a]
Affect	X	X		
Class Design	X	X	X	
Impact	X	X	X	X
Actor Credentials			X	
Unexpectedness	X[b]	X		

Note: X indicates that the pertinent characteristic often appeared in contributions of that type.
[a]These experiences were rare, with only four such experiences referenced in the analyzed sessions. [b]Unexpectedness only appeared once in student experiences.

Classroom experiences as student exhibited characteristics consistent with the apprenticeship of observation literature. These experiences typically showed affect and impact. The impact seen was generally first-person, how it impacted oneself as a student. Aside from this, unexpectedness appeared once; in the one instance, Liz (as a student) had seen an unanticipated integration approach to a type of problem that she had already known how to do another way. So in general, unexpectedness does not seem to be a defining characteristic of student experiences.

Classroom experiences as teacher paralleled student experiences in many ways. These were characterized by affect, class design, and impact in much the same way as student experiences. Experiences were personally significant, with impact almost always being first-person. Different from student experiences, many experiences stood out because of unanticipated events; this may reflect teachers' expectations and efforts to design and control the classroom environment.

Classroom experiences as observer differed from the former in several ways. These experiences were personally detached incorporated a more flexible perspective than the student and teacher experiences. These experiences showed a level of emotional detachment, noted by absence of affect; this detachment is consistent with the lack of first-person impact. Instead, impact was always third person, including examples of impact on teachers as well as students; in this way, these experiences were more flexible, allowing a view of both student and teacher.

Tutoring experiences were elusive, only making an appearance four times, all during discussions on mathematical content. In these cases, they showed impact and detail, but the detail was different than class design; it was detail regarding the mathematical content, suggesting that these experiences may present different characteristics. This also suggests that such experiences may contribute very differently to individuals' teaching knowledge, addressing different aspects of teaching than classroom experiences.

Discussion and Implications

The apprenticeship of observation described by Borg (2004); Lortie (1975); John (1996) coincides with our group of personal educational experiences as student. As we discussed these experiences are biased by: (a) students' unilateral view of the experience, and (b) emotion experienced in the moment; these seem to parallel the characteristics we identified as personal impact and affect associated with recounted student experiences. Teaching experiences show similar characteristics, implying that they may have similar limitations and biases; they may tend to create a self-centered and incomplete view of the experience.

In these ways, teaching observations can have benefits over student and teacher experiences. These experiences still seem able to capture the pedagogical aspects of the classroom environment, but with a wider viewpoint than teacher and student experiences; they allow participants to view the consequences of classroom actions, both as they affect teachers and students. They seem to allow this without a self-centered view.

On the other hand, even these experiences show the potential for bias. There is still an aspect of judgment connected with characters in the experience; experiences can gain/lose credibility based on the observer's perception of the teacher, rather than a truly objective judgment based on how instructional decisions played-out. Furthermore, the distanced perspective (or lack of involvement) means that these experiences are also incomplete, for they leave-out pre-class and moment-to-moment decisions involved in teaching. Thus, these experiences can also lead to incorrect conclusions and paint an incomplete picture of teaching and learning.

In spite of these biases, our results suggest that all types of classroom experiences, as teacher, student, and observer, can be critical to discussions regarding teaching. These experiences have key characteristics that empower individuals to discuss different aspects

of teaching.

For all their limitations in perspective, personal educational experiences provide detailed encounters with classroom pedagogy and classroom interactions. They help participants encounter problems and difficulties that may arise in teaching and provide possible solution strategies. They allow individuals to relate to both teachers and students, allowing them to justify decisions and understand what goes on in the classroom. By their connected and personal nature, teacher and student experiences help individuals understand the impact of teaching decisions on the individual—student experiences on students, and teaching experiences on teaching. Observational experiences allow individuals a disconnected and more rounded view of the teaching experience. These different experiences have the potential to provide complementary perspectives on the teaching environment. Each provides a perspective the others lack.

It seems that there is a tension between peoples' personal experiences and professional development efforts. Our discussion suggests that this should not be the case. It may be that these experiences open up individuals' ability to assimilate and accommodate knowledge regarding teaching and learning, making teaching development personally accessible and giving individuals the ability to understand what may be taught in professional development.

This suggests that professional development may benefit by integrating and capitalizing on these various experiences. This would require an awareness of the experiences that participants bring to a professional development program. Preservice teachers typically come to their programs with extensive experiences as students (the apprenticeship of observation), but no teaching or observational experience. Thus, they tend to see the student side of the equation. Early field experiences, lesson planning, grading, and microteaching might all provide alternative perspectives; however, it seems important that they be prepared and debriefed from such experiences in such a way as to help aspects other than simply the student side of the equation to surface.

Inservice teachers and faculty may (on the other hand) be prone to focus on their current teaching experiences. This could lead to a tendency to overlook the impact of their decisions on student learning. As teachers, they are positioned to access the student side of the experience, by their assessment strategies and the way that they engage students in classroom dialogue. In this situation, facilitators could amplify this focus by directing conversations to topics related to student impact. Observations of other faculty with discussions on student learning may also enhance these discussions.

Finally, GMTA discussions are dually affected. GMTAs are concurrently having both teacher and student experiences. This may be an ideal opportunity to integrate both teacher and student perspectives. These experiences could be complemented by observations.

Beyond classroom experiences, tutoring experiences may provide a different perspective. It may provide an avenue into unpacking content knowledge and accessing student thinking.

Overall, we need to understand that the apprenticeship of observation is not a closed door, but rather is only a part of a larger and ever growing collection of personal experiences, all of which bring their own powers and biases. Teaching development needs to become a true apprenticeship, a mentoring experience wherein teachers continue to add to their experience base, and wherein programs and facilitators find ways to actively frame, capitalize, and integrate those experiences, harnessing the power of personal experience, rather than fighting against it. How to do it is the big question.

References

Belnap, J. K., & Allred, K. N. (2006a). *Mathematics teaching assistants: Ascertaining their involvement in university instruction.* Manuscript submitted for publication, Brigham Young University.

Belnap, J. K., & Allred, K. N.(2006b). *Mathematics teaching assistants: Their instructional involvement and preparation opportunities.* Manuscript submitted for publication, Brigham Young University.

Belnap, J. K., & Withers, M. G.(2008a). *Discourse analysis: The problematic analysis of unstruc-*

tured/unfacilitated group discussions. Manuscript submitted for publication, Brigham Young University.

Belnap, J. K., & Withers, M. G.(2008b). *Teaching discussion among graduate mathematics teaching assistants: Elements contributing to teaching discourse.* Manuscript submitted for publication, Brigham Young University.

Borg, M.(2004, July). The apprenticeship of observation. *ELT Journal*, *58*(3), 274–276.

Carter, K., & Anders, D. (1996). Program pedagogy. In F. B. Muray (Ed.), *The teacher educator's handbook: Building a knowledge base for the preparation of teachers* (pp. 557–592). San Francisco: Jossey-Bass.

Cobb, P., & Yackel, E.(1996). Constructivist, emergent, and sociocultural perspectives in the context of developmental research. *Educational Psychologist*, *31*(3/4), 175–190.

Fernandez, M. L.(2005). Learning through microteaching lesson study in teacher preparation. *Action in Teacher Education*, *26*(4), 37–47.

John, P. D.(1996). Understanding the apprenticeship of observation in initial teacher education. In G. Claxton, T. Atkinson, M. Osborn, & M. Wallace (Eds.), *Liberating the learner: Lessons for professional development in education* (pp. 90–108). New York: Routledge.

Knowles, J. G., & Cole, A. L. (1996). Developing practice through field experiences. In F. B. Murray (Ed.), *The teacher educator's handbook: Building a knowledge base for the preparation of teachers* (pp. 648–688). San Francisco: Jossey-Bass.

Levine, M.(1996). Educating teachers for restructured schools. In F. B. Muray (Ed.), *The teacher educator's handbook: Building a knowledge base for the preparation of teachers* (pp. 620–647). San Francisco: Jossey-Bass.

Lortie, D. C.(1975). *Schoolteacher: A sociological study.* Chicago: University of Chicago Press.

Mesa, V., & Chang, P. (2009, January). *Dialogical engagement in two interactive mathematics lessons.* [Abstract] Joint Mathematics Meetings, Washington, DC.

Nassaji, H., & Wells, G.(2000). What's the use of 'triadic dialogue'?: An investigation of teacher-student interaction. *Applied Linguistics*, *21*(3), 376–406.

Sherin, M. G.(2000). Viewing teaching on videotape. *Educational Leadership*, *57*(8), 36–38.

Sherin, M. G., & Han, S. Y.(2004). Teacher learning in the context of a video club. *Teaching and Teacher Education*, *20*(2), 163–183.

Stengel, B. S., & Tom, A. R.(1996). Changes and choices in teaching methods. In F. B. Muray (Ed.), *The teacher educator's handbook: Building a knowledge base for the preparation of teachers* (pp. 593–619). San Francisco: Jossey-Bass.

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Truxaw, M. P., & DeFranco, T. C. (in press). Mapping mathematics classroom discourse and its implications for models of teaching. *Journal for Research in Mathematics Education.*

Walter, J. G., & Gerson, H. (2007). Teachers' personal agency: Making sense of slope through additive structures. *Educational Studies in Mathematics*, *65*(2), 203–233.

Wells, G. (1996). Using the tool-kit of discourse in the activity of learning and teaching. *Mind, Culture, and Activity*, *21*(2), 74–101.

Zevenbergen, R. (1996). Constructivism as a liberal bourgeois discourse. *Educational Studies in Mathematics*, *31*, 95–113.