PRESERVICE ELEMENTARY TEACHERS DEVELOPING UNDERSTANDINGS OF SELF AS MATHEMATICS TEACHER AND TEACHING IN CONTEXT

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As preservice elementary teachers (PSTs) examine their personal readiness, instructional practices, and their agency in enacting those practices, a ubiquitous question is "What can I do?" to support all students in learning mathematics amidst social, political and institutional dynamics present in today's classrooms. This paper explores how PSTs are developing understandings of self as mathematics teacher and of teaching through participation in a seminar designed to support critical examination of themselves as mathematics teachers, and if and how this self-examination is consequential for their understandings of teaching, particularly as within complex realities of schooling and attention to equity and access.

> I think I am experiencing an identity crisis as a teacher. …As far as me as a math teacher, I am not sure where I see myself. I want to believe that I will be using problematic tasks and encouraging my students to explore and to question. And I *hope* that I won't be skilling and drilling my students. I *hope* I won't be using mind numbing workbooks and textbooks. I *hope* my students are learning and growing in my classroom. I *hope* I continue to see them as unique individuals, not just as test takers. I *hope* I am still reflective and responsive to my students' needs. I *hope* that I am flexible and constantly strive to improve my teaching. I *hope* I am not stuck in a rut. I *hope* I haven't succumbed to the pressures of high stakes testing. And, I *hope* that I will think of the administrators and other teachers at my school as allies, not adversaries. (Sarah, March 29, 2010)

Sarah wrote this vision statement during the last semester of an intensive elementary master's certification program after completing over two semesters of coursework toward her degree and interning for seven months in a third-grade classroom. Sarah's writing highlights the complexity of teaching mathematics in the realities of her classroom context. Sarah essentially asked, "What can I do?" a complex question heard in preservice teacher education as preservice elementary teachers (PSTs), such as Sarah, question their personal readiness to engage in instructional best practices, their understanding of what those practices are, and their agency in enacting those practices in school contexts. As she discussed in other writings, for example, Sarah remained uncertain about how to actually work towards equity in mathematics by employing teaching practices such as engaging students in conceptually rich mathematics in this era of high-stakes testing. While it is generally accepted that teacher preparation needs to include an emphasis on best practices (Ball & Forzani, 2009) and classroom analysis (Hiebert, Morris, Berk, & Jansen, 2007), it also must prepare PSTs to navigate the many social, political, and institutional dynamics in classrooms so they can enact equitable teaching practices that best support *all* students in learning with understanding. Successful negotiation of these dynamics requires that teachers have an examined vision of their goals of mathematics teaching, the social and political contexts of schooling, and the realities of their school contexts, that is, understanding of themselves as mathematics teachers. The paper explores how PSTs develop understandings of themselves as mathematics teachers, and if and how this self-knowledge is consequential for

their understandings of mathematics teaching, particularly as situated within the complex realities of schooling and with attention to equity and access.

Elementary teacher preparation is further complicated by elementary teachers' positioning as generalists (Brown & McNamara, 2005), such that they may not identify as mathematics teachers or attend specifically to creating rich mathematical experiences. Elementary teachers' existing beliefs and their personal, perhaps damaging, mathematical experiences also influence their interpretations of curricula and reform (e.g., Drake, 2006) and conceptualizations of mathematics (Gellert, 2000). In the complexity of their mathematics teaching environments and their complex positioning, PSTs highlight different tensions through three iterations of the question, "What can I do?": a) What can *I* do?, with emphasis on personal readiness; b) What can I *do*?, focusing on actionable steps; and c) What *can* I do?, attending to personal agency (Pollock et al., 2010)? In response, teacher preparation needs to emphasize dispositions and knowledge that relate specifically to mathematics and mathematics teaching for understanding, while also supporting elementary PSTs in understanding themselves, their students, and the social, cultural, and intellectual contexts of teaching.

Without approaches in mathematics teacher education that address the complex situations or multiple dynamics with which PSTs will contend as novice teachers, PSTs are unprepared for the realities of public schooling. In particular, PSTs need approaches that attend to issues of equity, self-understanding, and the social and political contexts of teaching within content-specific teacher education (Crockett & Buckley, 2009). The consequences of leaving teachers unprepared for the realities of schooling are damaging, not only for those teachers, but also for students, as teachers who are unprepared may be unable to provide all students opportunity to learn or to enact equitable mathematics teaching practices. Developing an understanding of self as mathematics teacher, which for Sarah means examining her own relation to the complexities in her context, may build capacity for making sense of one's relation to these dynamics and the realities of schooling and critically analyzing teaching decisions. This understanding of self as mathematics teacher is related to what the research literature frames as teacher identity. The theoretical perspective of this study extends current perspectives of identity, as simultaneously personal and social and in constant negotiation (e.g., Wenger, 1998; Holland, Lachicotte, Skinner, & Cain, 1998), but emphasizes the importance of individual's awareness of the construction of identity and active engagement in its negotiation (Butler, 1999).

I contend that engaging PSTs in understanding that *mathematics teacher* is a complex construction supports them in making sense of their relation to the multiple dynamics and forces present in their mathematics classrooms, or in understanding themselves as mathematics teachers. This understanding should be framed by prevailing discourses of teaching, mathematics, and students, and by local discourses within their teaching contexts. Further, it builds PSTs' capacity for navigating their contexts and taking up particular mathematics teaching practices that support access to mathematics and equitable learning environments, such as teaching students through methods of inquiry and problem solving (NCTM, 2000). As Butler (1999) argues, understanding how identity is situated and negotiated—simultaneously, asserted and threatened—may open possibilities for PSTs to reconstitute mathematics teacher identity with a different set of attributes and engagements.

In applying Butler's (1999) perspective of gender identity to elementary PSTs, the following questions guide this research: 1) How does the seminar support PSTs to critically examine their understandings of themselves as mathematics teachers and the discourses that shape those understandings?, and 2) How are PSTs' understandings of themselves as mathematics teachers

and of related social and political discourses consequential for whether and how they take up new understandings of self as mathematics teacher and teaching in context?

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To begin your second paragraph, do not leave a blank line. Be sure to indent again. Indenting should happen automatically if you are using the style sheet or the ruler bar correctly.

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Theoretical Framework

Conceptions of teacher identity assume that identity is dependent on and formed within contexts, and is relational, shifting, and multiple (Rodgers & Scott, 2008). Becoming a teacher is not developing *an* identity, but is developing *identity* as a continuous process of constructing and deconstructing understandings within the complexities of social practice, beliefs, experiences, and social norms. This is similar to Butler's (1999) description of the process of becoming a woman: "If there is something right in Beauvoir's claim that one is not born, but rather one *becomes* a woman, it follows that *woman* itself is a term in process, a becoming.… As an ongoing discursive practice, it is open to intervention and resignification" (p. 45). Being and becoming a teacher also should be seen as open to continuous identification and reidentification. For example, Sarah engaged in this ongoing process during her internship, identifying how her mentor's actions were shaping her interactions with her students, and, thus, how she saw herself as a teacher in relation to her mentor:

I find myself yelling at my students and I'm like, "Why am I yelling at them? They just don't get long division yet!" But … I feel my mentor, her voice, and it's like, "Is that me?" because I used to not be a yeller. Have I become *that* teacher? …Have I turned into my mentor? (April 27, 2010)

What Sarah is doing—struggling with the internal and external forces that are shaping her understandings of herself as a mathematics teacher—is identity work. Understanding of self as mathematics teacher is situated within and shaped by historical, political, and social contexts, and also influenced by other individuals and imposed constraints. Prevailing discourses about mathematics teaching and learning and local discourses within their teaching contexts influence PSTs' understandings of mathematics teaching (e.g., de Freitas, 2008) and may shape their engagement with teaching and learning to teach. These may include: institutional discourses around curriculum and testing (e.g., Brown & McNamara, 2005); social discourses around race, class, and student abilities (e.g., de Freitas & Zolkower, 2009; Sleeter, 2008); or, discourses of teacher as "savior" (e.g., Britzman & Pitt, 1996).

My theoretical premise is that deconstructing these contexts, expectations, and constraints and challenging PSTs to question them and the dominant discourses that frame mathematics teaching—the "culturally established lines of coherence" (Butler, 1999, p. 33)—is encouraging PSTs to be actively involved in the process of identity work. Developing awareness of these dynamics means "unpacking the invisible knapsack" (McIntosh, 2001, p. 180) of the implicit discourses that have shaped and are shaping their understandings of being mathematics teachers and making these discourses explicit. For Sarah, that may include thinking about *why* she may "succumb to the pressures of standardized testing" or otherwise lose the flexibility or responsiveness she aspires to demonstrate in her mathematics teaching. According to Butler (1999), deconstruction, as a process of critically examining the meaning and "substantive

appearance of gender", identifying "its constitutive acts, and locat[ing] and account[ing] for those acts within the compulsory frames set by the various forces that police the social appearance of gender" (p. 45), can support resignification. As PSTs question these discourses and *deconstruct* (Butler, 1999) what it means to be mathematics teachers in context, they are examining themselves as mathematics teachers. Making sense of one's relations to the multiple dynamics in the mathematics classroom and developing understanding of self as mathematics teacher builds capacity for navigating these dynamics, attending to issues of equity, and being critical analytic about teaching decisions. Thus, this critical examination may lead PSTs to take up new understandings of being a mathematics teacher and of mathematics teaching.

Methods

Data collection took place during a seminar in the final semester of a 15-month elementary master's certification program and the required school-based fieldwork. Ten female PSTs, 23- to 34-years old, volunteered to participate in the eight 2-hour group sessions of the seminar and the study. One PST self-identified as African-American, one as an immigrant from Argentina, and eight as White.

Seminar Design

Seminar sessions engaged the participating PSTs in *deconstruction*, a process of critical examination of their understanding of themselves as mathematics teachers, teaching, and the political and social discourses that shape their understandings. The seminar design situated critical pedagogy (e.g., Ellsworth, 1989; Freire, 1970/2000; Kumashiro, 2000) in mathematics teacher education. Although PST education has attended to metaphors (e.g., Fenstermacher & Soltis, 1986) and the construction of a professional identity (e.g., Peressini et al., 2004), this seminar engaged theories of deconstruction and wove issues of self-understanding into content and context. PSTs analyzed case studies, transcripts, and videos, which provided opportunities for them to name and complexify prevailing discourses and positionings in relation to mathematics teaching and learning and to examine their own and others' practices. PSTs also completed writing assignments to relate these activities to their own positioning as mathematics teachers. Rather than reaching a predetermined understanding of certain content, the goal was for PST's self-understanding, where the PST asks how he or she is positioned and how others are positioned within discourses and "brings this knowledge to bear on his or her own sense of self" (Kumashiro, 2000, p. 45). That is, sessions served to open possibilities for PSTs to position themselves differently. Meeting as a group generated a sense of common cause and created a space for PSTs to voice their concerns as well as strategize; sessions, thus, became legitimate and valued spaces where PSTs could speak and others would listen.

Data and Data Analysis

I collected data from the seminar to examine: a) how PSTs develop understanding of themselves as mathematics teachers, b) how this is consequential for whether they take up new understandings of mathematics teacher and teaching; and, c) how the seminar supported PSTs' self-examination. Data include interviews, discussion transcripts, and PSTs' written work from the seminar.

Attention to PSTs' understandings of themselves and their take up of new understandings was analyzed through the particular discursive practices of "working difference" (Ellsworth & Miller, 1996). How PSTs are engaging in the particular discursive practices of working difference that attend to context, their positioning, and the positioning of others around an issue

that emerges as salient speaks to how the seminar is supporting critical self-examination. If understandings of self are conceptualized as positioning, then repositioning and negotiating positions suggests new understandings of self and personal readiness. How PSTs are taking up *new* understanding of mathematics teacher is operationalized through how PSTs are engaged in the particular discursive practice of showing the active labor of working difference (Ellsworth & Miller, 1996), that is, how they are repositioning themselves.

To understand how PSTs are taking up new understandings of mathematics teaching, I followed how individuals are problematizing one emergent issue through the sessions, attending to content of their conversations about teaching and the processes they engaged in their conversations. Problematizing teaching includes how PSTs are attending to the work of teaching and how they are negotiating three specific levels of attention— attention to core principles of teaching, strategies for instruction, and actions specifically for tomorrow's classroom (Pollock, 2008)—and using particular discursive practices in taking up and engaging in problems of practice (Horn & Little, 2010). Pollock's (2008) three levels of talk serve to structure the analysis of the content of the conversation, while attention the discursive practices of normalizing, specifying, revising, and generalizing (Horn & Little, 2010) are the processes of the conversation that the analysis follows.

Results

The following analysis focuses on two PSTs' understandings of self as mathematics teacher and how the seminar was consequential for their new understandings of mathematics teacher or teaching. The analysis continues the case of Sarah and presents a contrasting case of Brooke. Issues of assessment emerged as salient to both Sarah and Brooke; Sarah engaged in particular discursive practices that suggest her taking up new understandings of mathematics teacher and mathematics teaching, while, in contrast, Brooke did not. That is, the seminar did not support Brooke's new understandings of mathematics teachers or teaching in the same way.

Sarah's initial vision statement presented her "hopes" for herself as a mathematics teacher and her teaching. She presented the complexity of mathematics teaching and tensions with standardized testing and how testing frames students and their achievement: "I *hope* I continue to see them as unique individuals, not just as test takers." In Session 2, Sarah also shared how she was uncomfortable in hearing her mentor's voice in her own teaching, asking herself, "Is that me?" when she yelled at her students because of their difficulties with long division. My analysis suggests how Sarah felt uncomfortable with how her mentor was positioning students and their abilities and with how she was also positioning her students when they were having difficulties with long division. Sarah's discursive practices suggest that she struggled with concurrently supporting her students' learning and assessing them, either in mathematics class or in relation to standardized testing. Sarah engaged in unpacking her positioning by attending to institutional pressures of testing and pressures in her context.

Issues of assessment also emerged as salient to Brooke's understanding of herself as a teacher. In the following excerpt, Brooke emphasized, but resisted her positioning by issues of assessment, even minimizing its influence on her teaching:

> But see, I don't feel like [curriculum pacing] influences me all that much because like I'm spending five days on this stupid volume lesson, which really doesn't have the huge practicality of counting these imperfect block shapes, but I'm doing it because it is going to be on their unit assessment. But the majority of the stuff I teach is all beyond what is being assessed on those tests. So I feel like the test doesn't necessarily, like I make sure that I hit

those things but it is only like, you know, a couple of things that I need to do and I have a lot
more time that I get to do a lot more enriching things with my kids.

Brooke attended to how she is teaching "a stupid volume lesson" because the content is on the
assessment but also emphasized that she is not positioned by assessment: "It doesn't influence
me all that much." In this way, Brooke seems to resist how she is positioned by district-mandated
assessments, although she is spending a week of instructional time on a topic that she does not
value. Brooke did not attend to these tensions or to the political contexts of her teaching or
immediately engage in discursive practices of working difference (Ellsworth & Miller).

As the sessions continue, Sarah and Brooke engaged in different discursive practices with
working difference, that is, in understandings themselves as mathematics teachers in relation to
discourses about assessment. In a particular conversation in Session 4, PSTs highlighted
challenges and tensions with engaging students in rich tasks and assessments while grading
students in line with institutional constraints on teachers' flexibility with assigning grades. In
response to these tensions, PSTs began to complain and share categorical advice, which are
discursive practices that Horn and Little (2010) suggest are not conducive to the taking up of
problems of practice. Sarah, however, took up the tensions of assessment and shared a practice in
her classroom that aligned with principles of seeing assessment as an ongoing practice of
actively attending to student thinking in the context of her test-driven school culture:

> You have to give them opportunity. What I do a lot of times, as part of the morning routine, I
> don't give them morning work sometimes if I'm handing back like a big writing assignment
> or something. I'll leave it on the reading group table. Come and pick up your paper, read my
> comments, raise your hand if you have questions, and that's their morning work for the day.
> And you know, if you're monitoring and you're making sure they're not chit-chatting and
> they're, you know, staying on task, I've found that that's helpful. My mentor thinks it's a
> waste of time, she thinks it's stupid. I did [this] when I was in takeover, and I thought it was
> really helpful because I actually did have some kids come up to me and say, "What do you
> mean I'm not specific?" and like, "What does that mean?" I'm like, "You've got to give
> details." You explain it them, like so, "Oh, this is what you wanted." So I had like, you
> know, a couple of little writing conferences, and did it make big difference for everyone in
> the class? I don't know, but I do know it made a difference for two students in particular.

In attending to student thinking and supporting her students' continued reflection on their work,
Sarah presented assessment as a complicated process that she engaged in with students and
within her school context. Sarah engaged in discursive practices of problematizing practice by
specifying the problem through adding details of how she enacted this practice in her classroom
and by generalizing: "You have to give them opportunity." Additionally, Sarah wove together
attention to different levels of Pollock (2008) through presenting principles of assessment, a
strategy of how to enact this in her classroom, and the particular actionable steps she took. This
conversation was significant for how Sarah demonstrated her developing positioning in relation
to assessment, and it also created an opportunity for other PSTs to think about assessment, as
evidenced by further conversation.

Other PSTs followed by asking Sarah questions. Then, the conversation shifted to discuss
practices in mathematics assessment in primary grades as Candice asked about how to grade
first-grade students on their understanding of place value when they are just learning how to
count. Brooke interjected and shared how she graded second grade students' homework:

I'll be honest sometimes that it really kind of depends on my mood. Like, sometimes I'll be like, you know [shrugs shoulders], it's just that kind of day that I'm willing to be harsh on everybody. Which is bad. I know that we should be really consistent, but some days—

Brooke presented a solution grounded in her local context to the exclusion of attending to the complexity of assessing students. This is similar to her earlier comment about her volume lesson, where she did not attend to the prevailing discourses of testing, but focused on her current students. While assessment emerged as an issue that was salient to her understandings of herself and her teaching, analysis does not suggest that Brooke took up new understandings of assessment as situated within prevailing institutional discourses or problematized assessment or her current practices in this session or subsequent sessions in relation to these prevailing issues.

In her final presentation, Sarah, however, situated discourses of assessment into her mentor's current teaching context and its test-drive culture. Sarah emphasized how she did not appreciate her mentor's classroom management style or her mentor's strict and even negative interactions with students: "I struggled with [her mentor's style] throughout the year. She was too heavy handed with the kids. She relied on humiliation and fear." She ended her presentation, however, by presenting her understanding of assessment and her mentor in context:

Even though my presentation probably started very critical of her, she's an amazing teacher. She's just operating within this Title 1 environment, where there is all this pressure on teachers to maintain pace with the curriculum guides and FAST test. … I actually calculated the amount of hours and amount of days [of testing]. I think that it was something like over a month of school days were disrupted by testing. So, overall, I think that kind of informs my critique of her. I had a really good year, and I look forward to next year. (June 21, 2010)

Sarah noted how her mentor operates within particular institutional discourses and is positioned in specific ways by the curriculum guides, testing, and her students' high test scores, which made her an "amazing teacher" by the administration's standards. In response to her initial criticism of her mentor's management style, Sarah related her mentor's positioning and the pressures she felt, as brought on by testing and the Title 1 environment, to how her mentor positioned and responded to students. In this way, Sarah presented awareness of the complexity of the assessment and the work of mathematics teaching in challenging contexts and how being a mathematics teacher is contingent on and in response to contexts.

In addition to her new awareness of the complexity of being a mathematics teacher, Sarah demonstrates awareness of the value in the process of deconstruction and critical self-examination. Her deconstruction supports her in understanding the complexity of the particular interactions in her classroom, her mentor's positioning and how this positioning influences her expectations, her students and their learning. That is, Sarah's presentation suggests that she valued the process of deconstruction, as it allowed her—and will continue to allow her—to explore and question how students and teachers are positioned and navigate the social and political dynamics in schools and classrooms. Deconstruction is now a tool that she can use to inform future decision-making, supporting her agency in reidentifying with particular discourses, repositioning herself, and redefining herself as mathematics teacher.

Discussion

As a seminar for mathematics teacher education, analysis suggests that opportunities for PSTs to analyze discourses and positioning and discuss their implications on students and teachers may support PSTs' critical examination of their understandings of themselves as mathematics teachers and their teaching *when* there are continued opportunities to connect to their own contexts and experiences, such as in seminar discussion prompts and writing

assignments. Critical self-examination supported Sarah in taking up new understandings of mathematics teacher and mathematics teaching. Brooke characterized her positioning as *localized*, or in relation only to her particular field placement and current practices under her mentor, to the exclusion of how she positions herself towards or is positioned by broader social and political discourses. This suggests how some PSTs are strongly attending to their local contexts to make sense of how they are being positioned as mathematics teachers and more work with attending to the social and political discourses in her *specific* context may have supported her in attending to her complex positioning. Facilitating PSTs in connecting these discourses and positionings to their teaching contexts may empower PSTs, such as Brooke, to understand how they are positioned, a question of personal readiness, and to exercise agency—that is, what *can* I do?—in responding to prevailing discourses by taking up or rejecting certain positions. That is, deconstruction can become a practice used in mathematics teacher education for engaging PSTs in thinking critically about teaching and themselves and also a tool for supporting PSTs' own critical analysis of teaching practices.

Embedded in a conception of teacher identity as fluid and negotiated is "the implicit charge that teachers should work towards awareness of their identity" (Rodgers & Scott, 2008, p. 733). Teacher education has a responsibility to support PSTs in this identity work, that is, in navigating the social, political, and historical forces that are shaping their identity and the multiple demands in schools and mathematics classrooms, as this work is necessary for teachers to have the capacity to address issues of equity and access in teaching mathematics. By operationalizing identity and critical pedagogy in mathematics teacher education, this study contributes to research in mathematics teacher education by providing new tools for mathematics teacher education and attending to enduring questions of how to prepare teachers to enact equitable teaching practices in the complexity of today's classroom contexts.

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