"Everything Matters": Mexican-American Prospective Elementary Teachers Noticing Issues of Status and Participation While Learning to Teach Mathematics

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Abstract When prospective teachers learn to teach mathematics, they develop an understanding of content and pedagogy, which also includes strategies that encourage all children to participate in their learning. There is research that shows that issues of status and inequitable participation can hinder children's access to learning mathematics and can give children the impression that only some students can do mathematics. The following book chapter presents the experiences of three Mexican-American immigrant prospective teachers as they learn how to teach elementary mathematics and to notice issues of status and participation in their fieldwork. Data sources include coursework artifacts from the methods classroom, observations in the field and semi-structured individual interviews with the participants. Using the professional noticing framework, the findings suggest that the prospective teachers attended to, interpreted, and acted upon moments of unequal status and participation with children in the field over the course of the semester. Implications for teacher education and future research will be discussed.

Keywords Elementary mathematics · Teacher education · Status · Equitable participation · Professional noticing framework

> After watching this video I realized that everything matters: how we [as teachers] stand, where we stand, how we talk, and who we talk to… We decided to pick Jordan to come up front because we realized that he had good strategy, and *I am glad we did because it gave him the opportunity to participate in the class despite [the fact that] he is not proficient in Spanish yet, since this is his first year at Douglas [Elementary]*" (Maricela,[1] italics added for emphasis).

[1]All names have been changed to maintain the confidentiality of the participants.

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Introduction

Learning to teach mathematics is a process that is challenging, dynamic, and iterative. Prospective teachers learning to teach mathematics must attend to multiple aspects of their practice, including the mathematical thinking of their students and pedagogical strategies that elicit and extend this thinking (Berk & Hiebert, 2009; Stein, Engle, Smith, & Hughes, 2008). Yet, there are other aspects of teaching, such as affording children the opportunity to participate in the process of learning mathematics, which may hinder (or support) all children to learn mathematics. For example, traditional classrooms may not incorporate children's diverse knowledge, experiences, and resources that they bring to the classroom and as a result, not all children may have an opportunity to learn mathematics (Featherstone et al., 2011; Moschkovich, 2013).

In an effort to open more opportunities for children to learn mathematics, there is growing research about how a child's status (a perceived social ranking) (Cohen, Lotan, & Catanzarite, 1988) in the classroom can influence how (and/or if) they take an active role in the classroom (Featherstone et al., 2011). When children have equal status (e.g., academic, social, linguistic statuses) in the classroom, teachers can work toward a goal of promoting equity for all students in their classrooms (Boaler, 2006; Cohen & Lotan, 1995). The purpose of this chapter is to use the professional noticing analytic framework (Jacobs, Lamb, & Philipp, 2010) to explore the experiences of three Mexican-American prospective teachers (PTs) as they noticed issues of status and participation in their field experience classrooms. The chapter will begin by discussing what is already known about mathematics teacher preparation regarding status and participation. Ultimately, this chapter will return to Maricela, one of the participants in this study, to consider her conclusion that "everything matters" when it comes to recognizing issues of status and participation while learning to teach mathematics.

Background to the Problem

PTs come to their teacher preparation programs with a variety of skills, knowledge, experiences, and beliefs about what it means to teach mathematics (Hammerness et al., 2005). For many PTs, their prior educational experiences directly inform their vision for teaching mathematics (Lortie, 1975) and it can be challenging for PTs to negotiate their prior experiences with what they learn in their teacher preparation program (Hammerness et al., 2005). As reported by Ball (1988), teacher preparation programs should be places where all PTs are "unlearning to teach mathematics" so that they can adopt a more inclusive vision for what it means to teach mathematics.

The need for teachers to adopt a more inclusive vision for teaching mathematics is a pressing issue given the changing demographics in our classrooms. Our schools are receiving more immigrants and children who speak a native language other than English (Kena et al., 2015; Passel & Cohn, 2008), all of whom bring a wealth of mathematical knowledge and experiences. Unfortunately, traditional teaching strategies are typically effective for only a small subset of our student population (Grossman, Schoenfeld, & Lee, 2005). Traditional teaching strategies might ignore the mathematical resources of many other students and ultimately limit the opportunities for all children to participate and succeed when learning mathematics (Featherstone et al., 2011). The work of Funds of Knowledge (Moll, Amanti, Neff, & Gonzalez, 1992) and Cognitively Guided Instruction (Carpenter, Fennema, Loef Franke, Levi, & Empson, 1999), for example, describe frameworks that help teachers to adopt a vision for teaching mathematics so that all students participate in learning mathematics while helping students to utilize their mathematical resources (Gay, 2002; He & Cooper, 2009; Turner et al., 2012).

Some PTs already hold a vision for teaching mathematics that elicits and incorporates students' diverse needs, knowledge, and experiences. PTs who learned mathematics in a second language (Gomez, Rodriguez, & Agosto, 2008) and/or share the cultural background of their students (Vomvoridi-Ivanovic, 2012) may be familiar with strategies that encourage all children to be active participants in the learning process. For example, PTs like Cavazos (Cavazos, 2009), an immigrant who learned mathematics in a second language, openly resisted and dismantled the low expectations that her colleagues assigned to immigrant students. A note of caution though: it is naïve and shortsighted to expect that students will learn more mathematics only when their teacher shares in their cultural and/or linguistic background (Achinstein & Aguirre, 2008). Nonetheless, there is a need to understand how PTs learn to respond to the needs of their students so that more students can participate and be successful in mathematics.

Therefore, this particular book chapter poses the following research questions: (1) Using the professional noticing framework, in what ways do Mexican-American prospective elementary teachers recognize issues of status and participation in their prior experiences and address similar issues that might arise with their students in the field placements? (2) How might PTs' attention to status and participation inform their general vision for teaching mathematics for all students?

Conceptual Frameworks

This study used the following conceptual frameworks: (1) sociocultural learning theory, (2) status (based on the sociological theory of expectation states), and (3) professional noticing. First, sociocultural learning theory in mathematics education posits that people learn and do mathematics by interacting with each other, the curriculum, and the norms established in the classroom or context (Atweh, Forgasz, & Nebres, 2001; Lave & Wenger, 1991). The language, symbols, and

tools, which could denote the "culture" of the classroom, are established among teachers and students throughout the learning process (Vygotsky & Cole, 1978). Furthermore, a sociocultural learning perspective argues that students leverage their experiences, backgrounds, and interactions with others to construct meaning in their learning. This theory was selected because it specifically aligns with the second framework regarding expectation states theory and more specifically, issues of status.

To address issues of status and participation in classrooms, the study used the research of expectation states theory (Berger, Cohen, & Zelditch, 1972) and the research of Complex Instruction (Boaler, 2006; Cohen, Lotan, Scarloss, & Arellano, 1999). As described by Foddy (1988), the expectation states of a person are based on "beliefs that group members hold about each other's abilities to produce good or poor task performances" (p. 232). Status characteristics, which are fluid and differ based on the particular task at hand, include three types: (1) diffuse status characteristic (e.g., racial identity, native language); (2) specific status characteristics (e.g., based on one's specific profession or skill set); and (3) local status characteristics (e.g., status assigned to a peer or based on a school culture) (Featherstone et al., 2011; Horn, 2014). Simply put, expectation states theory claims that a child who has a low status characteristic is likely to be assigned a low expectation for their performance and therefore may adopt a similar perspective about their own potential to contribute to the task (Webster & Foschi, 1988). The research of Complex Instruction leverages the research of status by describing the ways in which teachers can carefully design tasks that foster equitable group work, build on students' particular mathematical strengths, and equalize student status (Cohen et al., 1999).

The professional noticing framework (Fisher et al., 2014; Jacobs, Lamb, & Philipp, 2010), based on the teacher noticing framework (van Es & Sherin, 2002), can help (re)direct teachers' attention toward particular aspects of classroom instruction. In general, the noticing framework is more than simply a tool to examine what teachers tend to notice about teaching, but to help teachers *analyze* what they saw, to make *connections* to some larger pedagogical implications, and to provide *suggestions* for future practice (van Es & Sherin, 2002). And as Sherin, Jacobs, and Philipp (2011) argue, "the word 'noticing' names a process rather than a static category of knowledge" and implies that teachers should constantly work to notice new aspects of classroom instruction as a means of developing their practice and expertise (p. 5). The professional noticing framework explicitly foregrounds the iterative ways in which teachers can use what they see and know about teaching in order to drive future instructional decisions (Jacobs, Lamb, & Philipp, 2010). Although this particular framework has been used to help teachers notice aspects of children's mathematical solution strategies (Fisher et al., 2014; Jacobs et al., 2010), this chapter used the professional noticing framework while elementary prospective teachers learned to teach mathematics in their methods coursework and fieldwork.

Methodology

Overview

The study is a subset of a larger qualitative phenomenological case study (Creswell, 2007) about the ways in which three Mexican-American PTs learned to teach mathematics for understanding (Hiebert et al., 1997) and incorporate children's out-of-school mathematical knowledge and experiences (Moll et al., 1992). The participants in the original study (the three female immigrants from Mexico and one American student who identified as Latino) were enrolled in a mathematics methods course[2] within a teacher preparation program in a large urban university in the Southwest part of the United States. For the purpose of the research questions, this study is limited to only the experiences of the three Mexican-American PTs with respect to how they noticed and addressed (if at all) issues of status and participation with their students, many of whom were also immigrants and native Spanish speakers.

During this semester, the three PTs (Sara, Miria, and Maricela) were concurrently enrolled in other methods courses (e.g., science, social studies, reading, writing) and completed fieldwork hours at an elementary or middle school where the majority of the students qualified for free and reduced lunch. Sara, Miria, and Maricela were placed with cooperating teachers (Ms. Arevalo, Mr. Cruz, and Ms. Cabrera, respectively) who were Mexican-American and native Spanish speakers and whose students were mostly Mexican-American and emerging bilinguals. More specifically, Sara and Maricela's field experience classrooms were designated as dual language, which meant that the teacher instructed in Spanish, for at most, 70% of the class time.

Data Sources and Analysis

Over the course of the 16-week methods semester, the following data was collected from the three PTs: mathematics autobiography, a series of interviews about problem-solving and children's funds of knowledge, reflections from lesson plan implementations, and video analyses of classroom instruction. Four semi-structured interviews and observations from the field were also conducted with respect to what the PTs were learning in their methods coursework and field experiences.

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[2]This particular mathematics method course was a part of a larger research project, TEACH Math (Teachers Empowered for Advancing Change in Mathematics) that was supported by the National Science Foundation under Grants No. 0736964 and 1228034. For more information about how TEACH Math research team conceptualized the assignments described in this chapter, please see Aguirre et al. (2013), Roth McDuffie et al. (2014), and Turner et al., (2012).

Using a content analytic framework (Krippendorff, 2012), the data sources were first divided and renamed as sampling units. Within these sampling units, recording subunits were created when the PTs attended to or highlighted (Jacobs et al., 2010; Goodwin, 1994) an issue of status or participation (Cohen & Lotan, 1995). For each recording subunit, a memo was generated that described the context in which the PT described the issue of status or participation. Table 1 shows examples from three of Maricela's recording subunits.

Table 1
Example from Maricela's recording subunit coding scheme

Mathematics autobiography	Maricela described a moment during her college class when she felt as though she did not have an opportunity to participate in the mathematical discussion because she was unfamiliar with the mathematical terminology in English
Problem-solving interview case study	During the Getting to Know You Interview, Maricela noted she learned about Jordan's struggles to learn mathematics in Spanish because he was not yet fluent in that language. Maricela documents specific strategies for helping Jordan to use his native language so that he communicated his thinking and to bridge this knowledge in Spanish. She specifically talked about how these strategies can help him participate and learn more mathematics
Whole group mathematics lesson	During Maricela's whole group math lesson, she described how she opened opportunities for Jordan to participate in the whole group sharing. She recognized that Jordan could contribute to the mathematical discussion and helped Jordan to communicate this thinking in his native language

The process of creating recording subunits and memos continued until the data was coded for each PT. Once the recording subunits were analyzed for each PT, the coding and memos were compared *across* the PTs and a single data source (e.g., the coding for Maricela's mathematics autobiography was compared against Miria's mathematics autobiography) in order to further refine the analysis across the PTs. In all, the data was analyzed in three ways: within the data sources from a single PT, across a single piece of data from all three PTs, and finally, across all PTs and all data sources. This process was replicated in order to achieve an accurate interpretation of the PTs' experiences during the semester.

As with all research, threats to validity (Maxwell, 2013) should be addressed when discussing any study's limitations. The larger portion of this particular study examined the PTs' perceptions of what they noticed in the classroom and their prior experiences and a threat to these reported perceptions and interpretations lies in the fact that some of the field experience teachers did not consent to be interviewed for the study nor permitted the researcher to conduct multiple observations of the PT in the field. Therefore, not all of the PTs' perceptions could be completely verified with what happened in the field. Finally, the notion of status and participation emerged from the data after the larger study concluded. Therefore, because the PTs were not consistently asked to attend to issues of status and participation throughout the semester, the findings do not assume that a PT who talked about status and

participation during their interviews and reflections were the only ones who happened to notice these issues during the semester. Nonetheless, this study acknowledges the limitations of the PTs' report from the field and aims to not overgeneralize the findings and implications.

Researcher Positionality

As a means of acknowledging the lens that the researcher used to conduct this study, the author identifies as a White scholar in the field of mathematics teacher education. Her goals as a mathematics teacher educator at a Hispanic Serving Institution in a large urban university is to help her PTs develop not only pedagogical content and content knowledge, but also to develop a lens for noticing issues of status and equitable participation in their classrooms. The experiences of Sara, Miria, and Maricela motivate her to constantly search for new ways to elicit and honor the resources that her PTs bring to their teacher preparation program.

Findings

The following section first describes what the PTs noticed about status and participation as mathematics students—narratives that draw from the PTs' mathematics autobiographies and initial interview. Next, the section describes what each PT noticed about status and participation as they completed their mathematics methods coursework and field experience. Finally, the section briefly describes a cross-case comparison of Sara, Miria, and Maricela.

Noticing Issues of Status and Participation in Prior Experiences

All three PTs were young adults and teenagers when they first immigrated to the United States: Sara and Maricela were both 18 and Miria was 14. The PTs similarly described how they struggled to learn mathematics because their teachers in the United States did not use effective linguistic strategies. As an example, Maricela recalled how she struggled to learn mathematics in college because many of her professors communicated mostly in English and rarely elicited her existing mathematical knowledge in Spanish. Maricela stated:

> It is not easy to take a college math class for the first time if you are not a native English speaker, so I had a hard time figuring out the math terminology in English. Some terms are very similar to Spanish, but some of them are completely different.

Maricela attended to how her teacher did not necessarily use strategies to help her bridge her existing mathematical knowledge in Spanish to learn mathematics in English and felt limited in her opportunities to participate. Sara reported a nearly identical experience in college as well. The diffuse high status characteristic of English fluency (mostly for students in the United States) was not explicitly assigned to Sara and Maricela, both native Spanish speakers, in their college classes.

On the other hand, Miria viewed her English fluency as an indication of her overall potential to succeed when learning mathematics. In one poignant instance, Miria described how she struggled to communicate her confusion about a mathematics problem to her high school mathematics teacher. She recalled

> I couldn't explain to [my teacher] what was my problem and he didn't do anything to help me. I got out of his classroom feeling really miserable. That day I understood that if I couldn't communicate in my new language I was never going to be good at math and it also made me start hating math.

Miria recognized the challenge she faced when trying to communicate her confusion to her teacher and she interpreted this challenge as a defining moment for her own self-efficacy in mathematics—English fluency was a high status characteristic in mathematics classrooms in the United States. Later in her reflection, Miria described a goal for herself as a teacher in response to what she experienced when she wrote "I also want to have strategies to help the students who don't speak English, because that way they will be more engage[d] during the activities as well as more comfortable." Each of the PTs came to the United States with varying levels of English fluency and experienced challenges when learning mathematics in a second language. The PTs began their methods coursework and field experiences with the overall goal that they would respond to the needs of *all* of their future students, not just those who happened to be fluent in English, the dominant language of instruction.

Noticing Issues of Status and Participation During the Mathematics Methods Semester

Over the course of the mathematics methods semester, Sara, Miria, and Maricela each recognized various issues of status and participation by reflecting on their own experiences and by observing the practice of other teachers. In some cases, PTs like Sara typically noticed issues of status and participation when she was prompted by a course assignment or interview question. Yet on the other hand, PTs like Miria and Maricela noticed issues of status and participation that arose in their field experience without being prompted. The findings will describe the individual PTs' experiences as well as the similarities and differences across their experiences.

Sara. Sara first attended to and interpreted a moment of inequitable participation when she and her classmates were asked to analyze a video clip from the

Annenberg Learner Video online series. In the "Marshmallow" video, a second-grade teacher posed a problem-solving task to her students to decide how many children can eat from a bag of marshmallows if each child will eat six marshmallows. As the PTs watched the video, they were explicitly asked to analyze the video by considering, "Who participates? Does the classroom culture value and encourage most students to speak, only a few, or only the teacher?"[3] In the quote below, Sara specifically noticed one child in particular, Marisa, who appeared to have a high academic status:

> Marisa is the one that was assumed to know the answer. She was always participating and jumping into the discussion. And I put that the students were assigned low and high status because, you know, when she [the teacher] ask[ed], "did you choose a spokesperson?" and they all point to this girl [Marisa.]

Although Sara attended to Marisa's high status and role as a spokesperson, Sara did not explain the status characteristic that Marisa held in order to be selected for this role nor did Sara provide a suggestion as to how she might balance the status among the other children in the video. Nonetheless, Sara continued to attend to and interpret the teacher's use of English and Spanish as one way to help more children participate in the task when she stated:

> …all students are encouraged to participate and their feeling of community and students are encouraged to participate and share their ideas. Even one girl [speaks] in Spanish and the teacher translated for the rest of the group so this allowed for the students' opinions to feel valued and appreciated.

Even though Marisa appeared to have a high academic status in the video, Sara still interpreted the teacher's use of the children's native language as a helpful move that afforded more children the opportunity to contribute to the mathematical discussion and learning.

Near the end of the semester, when Sara presented to her classmates about her whole group mathematics lesson plan, she showed a video clip of her lesson about creating equivalent fractions. After Sara showed a video clip of her lesson, she discussed about the ways that she attended to the needs of her emerging bilingual students in the classroom when she stated "I used English and Spanish because he [Sara's student] is an ELL [English Language Learner] and sometimes has a hard time understanding English. That's why I switched to Spanish." Sara attended to a small group of students who were struggling to understand the objectives of the lesson as it was presented in English. She interpreted this issue as an opportunity to use her Spanish fluency to help her emerging bilingual students participate in the mathematics task. Sara then responded to her student's needs by communicating the details of the task in Spanish, the child's native language. Sara practiced using the responsive strategies that she was familiar with as an emerging bilingual student herself. The findings suggest that Sara did not report about a child's perceived

[3]For more details on the lenses that focus PTs' attention to different aspects of classroom instruction while watching video clips, please see Roth McDuffie et al., (2014).

status unless she was specifically prompted by an assignment or interview question (i.e., Marisa's high status in the video clip and her reflection of her whole group mathematics lesson). Sara typically reported about how the ways in which she opened opportunities for all of her students to participate and communicate their thinking.

Miria. Similar to Sara, Miria noticed issues of status and participation when specifically prompted to do so in her practice and the practice of others. When Miria watched the same marshmallow video, she noticed Marisa's high status, as did Sara. More specifically, Miria noticed how the teacher used the rug as a means of facilitating a whole group mathematics discussion:

> So I think most of the instruction took place at the rug. And this is because, I think, it's the, like when she [the teacher] did the graph, it was easier for the students to see the graph. It was easier for them to know [sic] what she was asking for. And it was a way to control more participation…[for the teacher] to hear the students and [for the students] to hear her.

Miria attended to and interpreted the opportunities for children to participate in the video given that the physical object of a rug both helped the children to see the graph and participate in the whole group conversation. Miria perceived the rug as a tool for facilitating equitable participation among the students in the video.

During an interview later in the semester, Miria noticed how sometimes whole group discussions could limit some children's opportunities to participate in that discussion. I asked Miria to elaborate about the perceived status of her students and how Mr. Cruz, her field experience teacher, facilitated whole group mathematical discussions. In the following quote, Miria attended to an issue that arose when the children were positioned on a rug and engaged in a whole group discussion except for children like Letty, a child who received special services, rarely had an opportunity to contribute:

> …the same ones that answer all the time are the ones [who] raise their hand and speak out. And I think I would [call on all of them]. I know the little girl [Letty] has an aide too. She understands [the question asked] if you explain to [Letty]. I think she's really good if you help her to look at you and explain to her what you're saying, but she sits in the back… I don't know why [Mr. Cruz] does that….Maybe [I will] make sure that the special needs [children] understand what they are doing by asking them questions, make sure the ones that are learning English are understanding too. Not just [assume that if] one kid [speaks up] and because that kid understands, then everyone understands.[4]

Unlike Sara, Miria attended to Letty's physical positioning and interpreted Letty's isolation as a specific student status issue in Mr. Cruz's classroom. As a means of equalizing the students' status in the class, Miria suggested that she would call upon all students to contribute. Miria's vision for teaching mathematics, extended beyond noticing issues of emerging bilinguals, Letty, a native English speaker who received special services, was also in Miria's purview.

[4]Some of the PTs' quotes were edited in order to provide more clarity and context based on extended interviews.

Maricela. Maricela placed the needs of emerging bilinguals at the forefront of her vision for teaching mathematics, as did Sara and Miria. Yet unlike the previous PTs, Maricela spent much of her methods coursework and field work focusing on the needs of one particular child, Jordan, a student in her field experience class. Jordan was a White, native English-speaking child in Ms. Cabrera's third-grade classroom, Maricela's field experience classroom. Ms. Cabrera's classroom labeled as dual language where 70% of the instruction was in Spanish and 30% was in English. Maricela noticed that Jordan, a child who she perceived to have low academic status, experienced limited opportunities to participate in the mathematical discussions. Maricela reflected on what she noticed about Jordan and Ms. Cabrera.

> …And my teacher is like assuming that he doesn't deserve even a 1 [a basic proficiency score], he's not trying to do it because he doesn't know how to do it. Cause when I, when we solve problems together, he really knows, he really knew what to do and everything and he got them right. This kid knows, he can learn and everything and my teacher [says] that he doesn't even deserve a 1.

In the excerpt above, Maricela noticed that Jordan was assigned both a low diffuse status characteristic because he was an emerging bilingual and a low academic status characteristic because he struggled to communicate the mathematics that he did know. In Maricela's final report about Jordan, she noticed that Jordan, a second language learner, needed help communicating his thinking in class.

> What is happening to this child [Jordan] is similar what is happening right now with English Language Learners; the only difference is that he is a Spanish Language Learner. The teacher needs to use sheltered instruction techniques to help him understand, such as posters, word walls, videos, interactive games, etc. Things that can help Jordan make connections and have a better understanding of what is going on. The teacher needs to get to know him better to understand his needs, and make math and all the other subjects meaningful to him.

Maricela interpreted Jordan's fluency in Spanish as a contributing factor to his limited opportunities to participate in the lessons. Maricela responded to Jordan's situation by suggesting Ms. Cabrera utilize more explicit strategies with Jordan to support his learning. And for much of the semester, Maricela continued responding to Jordan's low status by helping him to learn mathematics in Spanish using his existing knowledge in English. When Maricela reflected on her whole group mathematics lesson, she talked about how she publicly reassigned Jordan to have high academic status by encouraging him to participate in the mathematics discussion:

> After watching this video [of me teaching my whole group lesson] I realized that everything matters: how we stand, where we stand, how we talk, and who we talk to...We decided to pick Jordan to come up front because we realized that he had good strategy, and I am glad we did because it gave him the opportunity to participate in the class despite he is not proficient in Spanish yet since this is his first year at Douglas elementary…Later you don't like think about all those things that can really affect the way you teach and the way your students perceive math.

As a college student, Maricela knew what it felt like to struggle to learn mathematics in a second language, much like Jordan, and as such, she responded to what she noticed by utilizing strategies that could support Jordan and reassign his status among his peers. What is important to note about Maricela is that she responded to the linguistic needs of Jordan, a child who would not typically fit the demographics of an emerging bilingual in the United States.

Discussion and Conclusion

Sara's, Miria's, and Maricela's experiences of learning to be respond to the needs of their students by leveraging their prior experiences is similar to what others have found in their research (Drake, Spillane, & Hufferd-Ackles, 2001; Gomez et al., 2008). The experiences of Sara, Miria, and Maricela complicate Lortie's (1975) assertion that PTs typically adopt similar strategies that their teachers employed with them. The three PTs in this study noticed when their teachers did not use effective strategies that bridged their mathematical knowledge between their native and second languages. While the PTs learned to teach mathematics, they considered and utilized strategies they thought would respond to the needs of emerging bilinguals like themselves. The strategies used by the three PTs encouraged more children to participate in the mathematical learning, not just those who are fluent in the dominant language of instruction.

The stories of Sara, Miria, and Maricela add to our understanding of how PTs learn to attend to the resources that students bring to the classroom (Aguirre et al., 2013; Fisher et al., 2014; Rodríguez & Kitchen, 2005). The findings from this study suggest that TEACH Math assignments such as a case study of a child's mathematical thinking and experiences (Turner et al., 2012) might also help PTs to notice issues of status and participation with their field work students.

Furthermore, the findings from this study also suggest that Miria and Maricela noticed issues of status and participation when it involved a child who was from a background *different than their own*. Miria described Letty, a child who received Special Education services, even though Miria never claimed to identify herself as someone who also received Special Education services. Maricela focused on the needs of Jordan, a White native English-speaking child in her field experience classroom. Without prompting, Maricela continued to perceive Jordan's low academic status and experienced limited opportunities to participate. Maricela designed and implemented a task so that she could publicly assign competence to Jordan, even though she did not perceive him as one who was expected to contribute to the classroom discussions.

The findings from this study also suggest that equalizing students' status is not a process by which raising the status of one child means the teacher must lower the status of another (Cohen & Lotan, 1995). As Cohen and Lotan (1995) suggest, "Participation however is not a zero sum game." (p. 26). In order to raise Jordan's status, Maricela did not need to lower the status of another child, but instead Maricela opened *more* opportunities for Jordan to be assigned a high status.

The implications from this study suggest that there is more to be learned about the ways in which PTs' prior experiences inform their vision for teaching mathematics, particularly with PTs emerging bilinguals and/or are immigrants. Because mathematics is culturally situated, "traditional" algorithms used in the United States may be unconventional elsewhere in the world (Gonzales et al., 2008). Therefore, it is imperative to explore the ways new teachers leverage their particular set of knowledge and experiences as a means to notice how all children can communicate their mathematical thinking, especially due to the increase of immigrants who need mathematics teachers that are prepared to respond to their needs (Passel & Cohn, 2008).

Furthermore, there is still more to learn more about how new teachers learn to consistently notice issues of status and participation in their practice as mathematics teachers (Boaler, 2006; Featherstone et al., 2011). How might teacher educators support PTs to sustainably notice issues of status and participation within multiple contexts? How can PTs learn to use their lens for noticing status and participation to drive future instructional decisions? How can methods instructors create spaces so that PTs and field experience teachers can learn more about how their instruction limits or encourages all children to be seen as smart in mathematics? As Maricela so eloquently stated, "everything matters" when learning to teach mathematics including learning to notice how nuanced issues like status and participation can play a role in our mathematics classrooms.

References

Achinstein, B., & Aguirre, J. (2008). Cultural match or culturally suspect: How new teachers of color negotiate sociocultural challenges in the classroom. *Teachers College Record, 110*(8), 1505–1540.

Aguirre, J., Turner, E., Bartell, T. G., Kalinec-Craig, C., Foote, M. Q., & Roth McDuffie, A. (2013). Making connections in practice: How prospective elementary teachers connect to children's mathematical thinking and community funds of knowledge in mathematics instruction. *Journal of Teacher Education, 64*(2), 178–192.

Atweh, B., Forgasz, H., & Nebres, B. (2001). *Sociocultural research on mathematics education: An international perspective*. Mahwah, N.J: Lawrence Erlbaum Associates.

Ball, D. L. (1988). Unlearning to teach mathematics. *For the Learning of Mathematics, 8*(1), 40–48. doi:10.2307/40248141

Berger, J., Cohen, B. P., & Zelditch, M. (1972). Status characteristics and social interaction. *American Sociological Review, 37*(3), 241–255.

Berk, D., & Hiebert, J. (2009). Improving the mathematics preparation of elementary teachers, one lesson at a time. *Teachers and Teaching, 15*(3), 337–356.

Boaler, J. (2006). How a detracked mathematics approach promoted respect, responsibility, and high achievement. *Theory into Practice, 45*(1), 40–46.

Carpenter, T., Fennema, E., Loef Franke, M., Levi, L., & Empson, S. (1999). *Children's mathematics: Cognitively Guided Instruction*. Portsmouth: Heinemann.

Cavazos, A. G. (2009). Reflections of a Latina student-teacher: Refusing low expectation for Latina/o students. *American Secondary Education. 37*(3), 70–79.

Cohen, E. G., & Lotan, R. A. (1995). Producing equal-status interaction in the heterogeneous classroom. *American Educational Research Journal, 32*(1), 99–120.

Cohen, E. G., Lotan, R. A., & Catanzarite, L. (1988). Can expectations for competence be altered in the classroom? In M. Webster & M. Foschi (Eds.), *Status generalization: New theory and research* (pp. 27–54). Stanford, CA: Stanford University Press.

Cohen, E. G., Lotan, R. A., Scarloss, B. A., & Arellano, A. R. (1999). Complex Instruction: Equity in cooperative learning classrooms. *Theory into Practice, 38*(2), 80–86.

Creswell, J. W. (2007). *Qualitative inquiry & research design: Choosing among five approaches*. Los Angeles, CA: Sage.

Drake, C., Spillane, J. P., & Hufferd-Ackles, K. (2001). Storied identities: Teacher learning and subject-matter context. *Journal of Curriculum Studies, 33*(1), 1–23.

Featherstone, H., Crespo, S., Jilk, L. M., Oslund, J. A., Parks, A. N., & Wood, M. (2011). *Smarter together!: Collaboration and equity in elementary math classroom*. National Council of Teachers of Mathematics.

Fisher, M. H., Schack, E. O., Thomas, J. N., Jong, C., Eisenhardt, S., & Tassell, J. (2014). Examining the relationship between preservice elementary teachers' attitudes toward mathematics and professional noticing capacities. In J.-J. Lo, K. R. Leatham, & L. R. Van Zoest (Eds.), *Research Trends in Mathematics Teacher Education* (pp. 219–237). Switzerland: Springer International Publishing.

Foddy, M. (1988). Paths of relevance and evaluative competence. In M. Webster & M. Foschi (Eds.), *Status Generalization* (pp. 232–247). Stanford, CA: Stanford University Press.

Gay, G. (2002). Preparing for culturally responsive teaching. *Journal of Teacher Education, 53*(2), 106(111).

Gomez, M. L., Rodriguez, T. L., & Agosto, V. (2008). Life histories of Latino/a teacher candidates. *Teachers College Record, 110*(8), 1639–1676.

Gonzales, P., Williams, T., Jocelyn, L., Roey, S., Kastberg, D., & Brenwald, S. (2008). Highlights from TIMSS 2007: Mathematics and science achievement of US fourth-and eighth-grade students in an international context. NCES 2009-001. *National Center for Education Statistics*.

Goodwin, C. (1994). *Professional vision. American anthropologist, 96*(3), 606–633.

Grossman, P., Schoenfeld, A., & Lee, C. D. (2005). Teaching subject matter. In L. Darling-Hammond, J. Bransford, K. Hammerness, H. Duffy, & P. LePage (Eds.), *Preparing teachers for a changing world: What teachers should learn and be able to do* (pp. 201–231). San Francisco, CA: Jossey-Bass.

Hammerness, K., Darling-Hammond, L., Bransford, J., Berliner, D., Cochran-Smith, M., & McDonald, M. (2005). How teachers learn and develop. In L. Darling-Hammond, J. Bransford, K. Hammerness, H. Duffy, & P. LePage (Eds.), *Preparing teachers for a changing world: What teachers should learn and be able to do* (pp. 358–389). San Francisco, CA: Jossey-Bass.

He, Y., & Cooper, J. (2009). The ABCs for pre-service teacher cultural competency development. *Teaching Education, 20*(3), 305–322.

Hiebert, J., Carpenter, T., Fennema, E., Fuson, K. C., Wearne, D., & Murray, H. (1997). *Making sense: Teaching and learning mathematics with understanding*. Plymouth, NH: Heinemann.

Horn, I. (2014). Seeing status in the classroom. *Teaching/Math/Culture.* Retrieved from http://teachingmathculture.wordpress.com/2014/03/10/seeing-status-in-the-classroom/

Jacobs, V. R., Lamb, L. L. C., & Philipp, R. A. (2010). Professional noticing of children's mathematical thinking. *Journal for Research in Mathematics Education, 41*(2), 169–202.

Kena, G., Musu-Gillette, L., Robinson, J., Wang, X., Rathbun, A., Zhang, J., … Dunlop Velez, E. (2015). *The Condition of Education 2015 (NCES 2015-144)*. Washington, DC: National Center for Education Statistics Retrieved from http://nces.ed.gov/pubsearch

Krippendorff, K. (2012). *Content analysis: An introduction to its methodology*. Los Angeles, CA: Sage.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. New York; Cambridge: Cambridge University Press.

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

Maxwell, J. A. (2013). Qualitative research design: An interactive approach. Thousand Oaks: SAGE Publications.

Moll, L. C., Amanti, C., Neff, D., & Gonzalez, N. (1992). Funds of Knowledge for teaching: Using a qualitative approach to connect homes and classrooms. *Theory into Practice, 31*(2), 132–141.

Moschkovich, J. (2013). Equitable practices in mathematics classrooms: Research-based recommendations. *Teaching for Excellence and Equity in Mathematics., 5*(1), 26–33.

Passel, J. S., & Cohn, D. V. (2008). U.S. population projections: 2005–2050. *Pew Research Hispanic Trends Project.* Retrieved from http://www.pewhispanic.org/2008/02/11/us-population-projections-2005-2050/

Rodríguez, A. J., & Kitchen, R. S. (2005). *Preparing mathematics and science teachers for diverse classrooms: Promising strategies for transformative pedagogy*. Mahwah, N.J.: Lawrence Erlbaum Associates.

Roth McDuffie, A., Foote, M. Q., Bolson, C., Turner, E., Aguirre, J., & Bartell, T. G. (2014). Using video analysis to support prospective K-8 teachers' noticing of students' multiple mathematical knowledge bases. *Journal of Mathematics Teacher Education, 17*(3), 245–270. doi:10.1007/s10857-013-9257-0

Sherin, M., Jacobs, V., & Philipp, R. (2011). Situating the study of teacher noticing. In M. G. Sherin, V. R. Jacobs, & R. A. Philipp (Eds.), *Mathematics teacher noticing: Seeing through teachers' eyes* (pp. 3–13). New York: Routledge.

Stein, M. K., Engle, R. A., Smith, M. S., & Hughes, E. K. (2008). Orchestrating productive mathematical discussions: Five practices for helping teachers move beyond show and tell. *Mathematical Thinking & Learning, 10*(4), 313–340.

Turner, E., Drake, C., Roth McDuffie, A., Aguirre, J., Bartell, T. G., & Foote, M. Q. (2012). Promoting equity in mathematics teacher preparation: A framework for advancing teacher learning of children's multiple mathematics knowledge bases. *Journal of Mathematics Teacher Education, 15*(1), 67–82.

van Es, E., & Sherin, M. (2002). Learning to notice: Scaffolding new teachers' interpretations of classroom interactions. *Journal of Technology and Teacher Education, 10,* 571–595.

Vomvoridi-Ivanovic, E. (2012). Using culture as a resource in mathematics: The case of four Mexican-American prospective teachers in a bilingual after-school program. *Journal of Mathematics Teacher Education, 15*(1), 53–66.

Vygotsky, L. S., & Cole, M. (1978). *Mind in society: The development of higher psychological processes*. Cambridge: Harvard University Press.

Webster, M., & Foschi, M. (1988). *Status generalization: New theory and research*. Stanford, CA: Stanford University Press.