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Kathleen Jablon Stoehr  
*Santa Clara University*, [kstoehr@scu.edu](mailto:kstoehr@scu.edu)

Marta Civil

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## **Conversations between Preservice Teachers and Latina Mothers: An Avenue to Transformative Mathematics Teaching**

Kathleen Jablon Stoehr & Marta Civil

### **Abstract**

Mathematics education researchers agree that students' mathematical learning can be positively impacted by making connections to their out of school experiences through a funds of knowledge lens. This is especially important for diverse students whose experiences are often underrepresented in school curricula. Making these connections can be challenging for teachers whose experiences often differ from their students. We examine how conversations between preservice teachers and Latina mothers influenced the teachers' creation of a mathematics lesson that connected to students' out of school experiences. Findings suggest the importance of offering preservice teachers opportunities to learn from parents about their children's out of school experiences.

### **Literature Review**

Mathematics education researchers agree that it is important for pre-service teachers (PST) to have the opportunity during their teacher preparation program to learn about the out of school experiences of the students they will teach and to incorporate this knowledge in their mathematics lessons (Anhalt & Rodríguez-Pérez, 2013; Author, 2007; Kitchen, 2005). In this article, we refer to students' out of school experiences based on the theory of Funds of Knowledge (González et al., 2005; Moll et al., 1992). Connections made between home and school can greatly benefit student learning (McElvain, 2015). The more PSTs learn about and from their students and their families, the more PSTs can also learn how to help children understand mathematics with respect to the way they use mathematics in their lives (Foote et al,

2013; Turner et al, 2012). Yet, while there is evidence that it is crucial to make connections between mathematics instruction and children's lived experiences, doing so is a particularly challenging task for new teachers (Ball and Tyson, 2011; Downey & Cobbs, 2007; Leonard, 2008; Author, 2016).

Making connections to students' out of school experiences is particularly important for students whose experiences and perspectives are underrepresented in school curricula (Author, 2007; Foote et al., 2013; Ensign, 2005; Galindo & Medina, 2009; Good, Masewicz, & Vogel, 2010; Ladson-Billings, 1995). As more than 50% of students in public schools reflect a more diverse set of cultural, linguistic, racial, and socio-economic backgrounds (Kena et al., 2015), it is imperative to help mathematics teachers learn to incorporate the diverse resources that all children bring (Foote et al., 2013). This is particularly important, as data from the National Center for Education Statistics (NCES) reports that "In 2017, the average mathematics score for 4th-grade ELL students (217) was 26 points lower than the average score for their non-ELL peers (243)" (p.112).

Previous research reveals that children are often more successful in mathematics when the learning is centered on experiences that occur at home and in their community (Author, 2001; Sandoval-Taylor, 2005). These experiences have the potential of providing students with *meaningful mathematics* that can result in supporting their classroom learning (Taylor, 2012).

Colegrove and Krause (2018) confirm that teachers must be committed to getting to know their students' out of school experiences in order to fully support their mathematics learning. Yet a 2017 survey conducted by the Association of Mathematics Teacher Educations (AMTE) revealed that one of the most pressing concerns for mathematics teacher educators is to adequately prepare new teachers to build relationships with the families and caregivers of their

future students. These relationships are crucial for learning about students' out of school experiences.

PSTs often learn about students from diverse backgrounds as they complete their methods courses and associated field experiences (Banks et al., 2005; Howard, 2006; Nieto, 2004; Vomvoridi-Ivanovic, 2012), but learning to incorporate children's experiences into their practice is challenging (Author, 2007; Ball and Tyson, 2011; Downey & Cobbs, 2007; Foote et al., 2013; Kitchen, 2005; Leonard, 2008; Turner et al., 2012). Mathematics teacher educators can scaffold the process of learning to make connections to children's out-of-school experiences by designing coursework assignments that support PSTs' opportunities to make these connections (Author, 2016; Foote et al., 2013; Turner et al., 2012). These types of assignments require PSTs to be directly involved with students. However, few studies exist that examine PSTs' first-hand interactions with parents, specifically aimed at supporting students' mathematics learning. In this study, we explore PSTs' understandings of how dialogues with diverse parents can help to support their learning to make meaningful connections between home and school in their future mathematics teaching.

### **PSTs Learning About and Incorporating Students' Out of School Experiences**

Previous research exists about how PSTs' think about and learn to make mathematics connections to children's home and community knowledge. Author (2017) conducted an investigation of 215 PSTs and their beliefs regarding the mathematics success of English learners. The findings revealed that many of the PSTs believed that children from diverse backgrounds came from homes whose culture negatively influenced their mathematics learning. In addition, a significant number of PSTs thought that these students and their families and communities were "lacking" what was needed to be successful in mathematics, especially as it

related to language. One PST stated:

I thought about if the student is an EL, I'm pretty sure that parents are also English Language learners. They are trying to kinda learn the culture and the language just like the child is. So if the parent can't really help the student with math or social studies or science, then I feel like that would hinder the child (p.73).

This study highlights the importance of disrupting the often-held belief that children from families and communities where English is not their native language are deficient. Offering PSTs with opportunities to learn about and build on the rich out of school experiences of diverse students (including language) and their families is critical.

Turner et al.'s (2012) study of 200 PSTs revealed that many of the participants believed that connecting to students' experiences outside of school was important, as they thought students might "take to a topic better" (p.74) and learn more mathematics. Some PSTs believed that by tapping into students' home and community knowledge, students and their families could be viewed as valuable knowledge resources. As Turner et al. (2012) state based on the work of González et al. (2005), "this awareness is consistent with funds of knowledge research that explicitly challenges deficit-based views of low-income communities of color" (p.75).

However, Turner et al.'s (2012) study claims that a major challenge that PSTs often experience in learning to make connections to students' home and community knowledge is the limited time they spend in the classroom and the exposure to the community, which is often different than their own. Time is needed in order to build a trusting relationship with students and their families to learn this knowledge. In addition, Turner et al. (2012) confer with Author's (2007) work that "eliciting and making sense of children's cultural, home, and community-based knowledge, and its relevance to mathematics instruction, is a complex practice that may begin to

develop in initial teacher preparation, but continues to develop as teachers enter the field” (p.76).

Similarly, one focus of Foote et al.’s study (2013) of twenty PST teachers was examining PSTs’ interest in making connections to students and their families in their mathematics teaching. Their findings reveal that although the majority of the PSTs had an interest in making these connections, they tended to be unsure of how they would do so. Some of the PSTs stated that learning mathematics that was relevant to their everyday lives could be meaningful for students. Other PSTs spoke of specific cases of mathematics that occur in students’ home and communities as particularly possible ways to frame mathematics learning at school. Learning from her students that they were engaged in the cooking that occurred in their homes one PST stated, “They talked about cooking a lot. ... And so we used that to talk about how we were measuring capacity when you measure a cup of water and so I was actually able to incorporate [cooking]” (p.132). After having the opportunity of getting to know her students better another PST reported,

When I did [teach] the second time, I did the problems that were in the context of their lives because I had a chance at that point to get to know them and what things they like. I rewrote the problems to be relevant to them, and the kids were so much more excited about solving them (p.132).

Foote et al.’s (2013) study also reveals that some of the PSTs did not recognize that relationships with parents and families could be important resources. Instead some PSTs tended to perceive communication with families as revolving around students’ performance and activities. In addition, although the PSTs believed that getting to know parents and families was important, they also viewed the time needed to do so as a major obstacle.

In related research, Author, (2016) explored what seventy-nine PSTs learned about

teaching mathematics while they engaged in a case study about a child's mathematical thinking, interests, competencies, and resources. One tenet of the study included a "getting to know you/funds of knowledge" interview. This interview provided the opportunity for PSTs to learn more about their case study student's interests as well as the child's home and community knowledge. From this interview as well as the informal opportunities the PSTs had to interact with the student (i.e. recess and lunch time, walking to a specialist class), the goal was for the PSTs to conduct two mathematics problem-solving interviews that made connections to their student's interests and their home and community-based knowledge. The findings of this study revealed that the majority of connections PSTs made revolved around assumptions about items or activities that most children would be familiar with or minor variations "such as inserting an object or setting that was known to be of interest, to what otherwise would be standard textbook-like word problems" (p.66). However, this study illustrates that these types of learning experiences offer PSTs the opportunity to begin to think about and make mathematics connections to children's interests and experiences.

Vomvoridi-Ivanovic (2012) conducted a study of PSTs' work with students in an afterschool mathematics program. The study revealed that when PSTs worked with students on traditional textbook tasks, they did not connect the tasks to students' home and community knowledge and experiences. However, when the PSTs engaged the students in a "recipe project" with more open-ended, contextualized mathematics tasks (not commonly found in traditional textbooks) that were directly connected to children's home and community knowledge and experiences, these connections were relevant and readily available for students to access. Moreover, this experience offered PSTs the opportunity to begin to learn how to make mathematics connections to students' out of school experiences.

Taken together, these studies illustrate the importance of offering PSTs the opportunity to engage with and learn from students about their out of school experiences, as these experiences may help PSTs make these important connections in their mathematics instructional plans. However engaging PSTs in conversations with parents may provide another promising avenue for PSTs to learn about children's out of school experiences and may offer an understanding of how these conversations can shape PSTs' planning of mathematics lessons. This is important to study so that children's out of school experiences can be recognized in the classroom and utilized to support student learning. In this article, we describe an approach to engage PSTs in conversations with parents. We illustrate this approach by discussing how one conversation between PSTs and Latina mothers influenced their creation of a mathematics lesson that connected to students' out of school experiences. We report on how this experience impacted PSTs' thinking about how they planned to make connections to their future students' out of school experiences to support their students' mathematics learning.

### **Theoretical Framework**

Our study is framed around two areas of research, the work on funds of knowledge and the literature on parental engagement, in particular that which focuses on Latinx parents. The second author has first hand experience with the Funds of Knowledge for Teaching project (González, et al. (2005)) and extended it further to focus on mathematics education (Author, 2002; 2007). The Funds of Knowledge for Teaching project was originally conducted in working class Mexican communities in Tucson, Arizona (Moll et al., 1992).

González et al. (2005) explain that funds of knowledge are based on the following premise: "People are competent, they have knowledge, and their life experiences have given them that knowledge. ... First hand research experiences allow one to document this competence



and knowledge” (p. ix-x). Viewing people and communities as tangible and valuable resources and leveraging these resources in classroom teaching hold great promise for student learning.

Funds of knowledge theory draws from the everyday life experiences that people encounter that are “formed and transformed within sociohistorical circumstance” (González et al., 2005, p.1). All households are comprised of strategic and cultural resources that if leveraged by teachers have the capacity to improve the educational quality for students particularly from underserved communities (Vélez-Ibañez & Greenberg, 2005). In other words, if classroom instruction was built around students’ out of school experiences, the potential for student learning could far outweigh textbook or mainstream instruction.

Our orientation to parental engagement draws on the literature that pays attention to issues of power and takes a critical perspective on the concept on parental involvement, particularly in relation to Latinx parents / families. We agree with Olivos (2006) for the need to reconsider what is usually implied by the term “parental involvement”, which “has far too often been diluted ... to a laundry list of activities that the ‘experts’ feel good parents ‘do’ to blindly support the schools’ agendas” (p. 13). Olivos also writes, “bicultural parents must begin to understand their roles within the socioeconomic and historic context from which their subordination and their children’s academic failure arises if they are to effectively contribute to the transformation of the school system” (pp. 16-17). In our study, we view having the group of mothers as experts on their children’s education and their community sharing their views with the prospective teachers as one step towards the transformation that Olivos calls for. Valdés (1996) is also critical of parental involvement efforts that are not based on a sound knowledge of the families that schools are aiming to “involve.” Similarly, Delgado-Gaitan (2012), Jiménez-Castellanos, Ochoa, and Olivos (2016), and Ramirez (2002) argue for the need for schools to

listen to the parents (particularly in reference to **minoritized** parents) and work with them as partners who have experiences and resources to bring to the table. We join all these authors as they argue for what we describe as the importance to understand parents' cultural ways of being including their language and culture, their views on education, and their value of "educación" which as Goldenberg and Gallimore (1995) describe, "whereas in English, someone who is "well-educated" is considered schooled, knowledgeable, and literate, in Spanish, "bien educado" has a different set of associations—respectful, dutiful, well-mannered" (p. 197).

Author (2003) bring together the concept of funds of knowledge and the need for an approach to parental engagement that listens to parents voices, with a focus on the content area of mathematics. In this way, they utilize the funds of knowledge framework to theorize the importance of creating a two-way dialogue between home and school, in particular in schools that serve low-income, culturally and linguistically diverse students. Key to Author's model is the need to view parents as intellectual resources as essential to establishing an authentic two-way dialogue between Latinx parents and teachers. This means that to create an authentic two-way dialogue, teachers and schools must commit to being genuinely interested and respectful of parents' views and uses of mathematics as well as explore ways for the schools' mathematics instruction to reflect parents' knowledge and experiences. Author also acknowledge the importance of parents engaging in learning about the school's approaches to teaching mathematics and that parents commit to explore connections between school mathematics and their everyday mathematical interactions with their children.

Wager (2012) and Taylor's (2012) work illustrates the importance of in-service teachers learning about their students' funds of knowledge as a means to leverage their students' out of school experiences into their mathematics teaching. Our investigation focuses on what PSTs

learned from parents about their children's out of school experiences and how they believed this understanding informed their future mathematics teaching.

## **Methodology**

### **Participants and Context**

The study reported in this article was part of a larger, multi-year and ongoing research project that builds on the second author's experience of more than twenty years leading research projects on parental engagement in mathematics grounded on the funds of knowledge concept. In the current project, we worked with teachers and mothers in two elementary schools in two different states to develop a two-way dialogue between school and home. The present study draws on the work at one of the schools and focuses on eight women elementary PSTs (three Latina, three White, one Asian, one Indian) who were part of a mathematics methods class of eleven students. Although eleven students were enrolled in the mathematics methods class, three of the students were practicing teachers. Given that the specific focus of this study was on PSTs and what they learned from parents about their children's out of school experiences, the practicing teachers' data was not included.

The eight PSTs were all student teaching in schools that served low socioeconomic and culturally and linguistically (Spanish speaking) diverse communities where the majority of students qualified for free or reduced lunch. All eight of the PSTs were in a Masters level teacher preparation program in a small private university located in the western United States. Six of the women were in their early to mid-twenties, with the other two women in their thirties and forties.

One of the main tenets of the mathematics methods course focused on the importance of teachers learning how to connect mathematics learning to students' out of school experiences through a funds of knowledge lens. This was especially critical, given the likelihood that the

PSTs would begin their teaching career in schools that were culturally, linguistically and racially diverse.

### **The Mathematics Project**

The PSTs worked together in small groups to complete a course assignment that focused on creating a mathematics lesson that was designed for PSTs to learn how to connect their students' out of school experiences to their mathematics teaching.<sup>1</sup> The goal of the assignment was to provide an opportunity for PSTs to strengthen their knowledge about mathematics teaching, their students, and the local community (or communities) that their assigned school served, by closely examining and documenting mathematical resources they could use for mathematics lesson planning purposes. A central tenet of the assignment was for the PSTs to have the opportunity to learn first hand about the knowledge and expertise of their students' families and community members. After completing the project, the PSTs were required to write a personal reflection about their experience.

The assignment required the PSTs to visit two community sites and interview individuals who worked at the site to learn about how they used mathematics on a daily basis. This provided the PSTs with an opportunity to identify resources for their lesson planning and for building relationships with community members. It also served as an opportunity for the PSTs to address the stereotypes or assumptions they may have had about students and families from diverse and underserved communities.

The PSTs were required to talk with their students about how they spent their time outside of school and were encouraged to meet with students' families to seek this information. However, given the often-limited access that PSTs have to engage with families during their

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<sup>1</sup> The assignment was adapted from the TEACH Math Community Mathematics Exploration Module.

student teaching placements, six Latina mothers from the community where the PSTs were assigned to do their student teaching were invited to attend the PSTs' mathematics methods class that coincided with the onset of the preparation of the mathematics project. This invitation afforded the PSTs to learn directly from the mothers about their children's out of school experiences. Inviting the mothers to the university site as respected guest speakers who held an important and highly esteemed knowledge base created a space for the mothers to be seen from an asset based perspective as well as a critical intellectual resource. In other words, the mothers were purposefully positioned in a university setting where their expertise and knowledge were valued and welcomed. Offering teachers the opportunity to understand the multiple assets around knowledge, culture, and language that Latina mothers possess is of grave importance (Ramos, 2014).

The conversation between the mothers and PSTs began with the mothers introducing themselves and sharing their child/children's first name, age, and grade level. The PSTs then introduced themselves and stated the grade level of their student teaching placement. The mothers were then invited to individually share their child/children's interests and where and how their families spent their time outside of school hours. In addition, the mothers' conversation included them sharing and comparing with each other the specific places their families spent time in their community (i.e. specific parks, family restaurants, churches, libraries). As the mothers were sharing with the PSTs and each other about their child/children's out of school experiences, the PSTs were asking clarifying questions about specific locations and activities as well as additional questions to gain a better understanding of the children's out of school experiences in this specific community.

Five of the six mothers spoke only Spanish so the three PSTs who were Spanish speakers were translating the mothers' conversation for the non-Spanish speaking PSTs as well as translating the non-Spanish speaking PSTs' questions for the mothers in Spanish. This focus group interview lasted for 50 minutes.

Upon the completion of the mathematics project, the mothers were invited to the mathematics methods class for the project presentations. The mothers offered verbal and written feedback to the PSTs about their projects. The project presentations lasted for approximately ninety minutes.

### **Data Collection**

Although multiple data sources were collected from the mathematics project assignment, this paper focuses on the individually written reflection that each of the eight PSTs wrote at the conclusion of the assignment. The prompts specifically analyzed for this study included the PSTs' reflection of how the opportunity to meet and learn from the mothers shaped or impacted how they created their mathematics project as well as what they learned about teaching mathematics to students from diverse communities. In addition, the PSTs were asked to think about how the experience of learning from parents about their children's out of school experiences might inform their teaching practice when they stepped into their own classroom the following year [See Appendix A for reflection questions]. These questions were designed by one of the author's for the purpose of understanding how interactions with the parents of the students they teach might inform their mathematics teaching.

The assignment required the PSTs to provide detailed descriptions and specific examples of what they learned from the mothers about their children's out of school experiences as well as how they believed this knowledge informed their future mathematics teaching.

## **Data Analysis**

After multiple analytic readings of each PST's reflection, we focused specific attention on how the experience of learning from the mothers about their children's out of school experiences might shape their teaching practice. We began with an iterative analysis (Bogdan & Biklen, 2006) by demarcating the words and phrases that pertained to the different reflection prompts, as we looked for patterns of key ideas related to 1) how the conversation with the mothers informed their mathematics project; 2) how they believed what they learned from the mothers might shape their future teaching of mathematics to diverse student populations; 3) how they might engage with the parents or guardians of their future students; 4) what they learned about themselves after having the conversation with the mothers. We then sorted the PSTs' key ideas regarding their experience of having a conversation with the mothers about their children's out of school experiences. Examples of these key ideas include the importance of communication with students' families, valuing parents' perspectives, understanding that differences among individuals and communities matter, and ways to consider learning more about students and their families as a means to inform their mathematics practice. We then wrote analytic memos (Maxwell, 2013) to summarize key ideas across the reflections of the eight PSTs.

We separated the PSTs key ideas into five themes that captured the main ideas across the PSTs' reflections. Within each category are themes that we titled using a composite of the PSTs' words to encapsulate the essence of the reflections. These themes are introduced in the findings section.

## **Findings**

### **Building Bridges/Building Relationships**

The eight PSTs spoke of the importance of building communication bridges between home and school so they could learn more about their students' families, allowing them to use what they learned to plan meaningful mathematics lessons. For example, Angela stated, "Beginning this project with a small forum, I found to be unique and humbling. Allowing parents from [school], who represent their families and their community, to be experts is a great way to build bridges between educators and the community we serve." Angela spoke of how this experience not only humbled her but provided her with the opportunity to see the mothers as "experts" or intellectual resources (Author, 2003) who could offer her important knowledge to inform her mathematics teaching.

As Alba reflected upon the conversation with the mothers she shared, "I believe that all this information can help me build relationships with my students and families, which will also allow me to use this information when planning meaningful learning experiences." Alba viewed the conversation with the mothers as essential to helping her "build relationships" with her students and families that she could then utilize in her mathematics teaching.

Sophia stated that she found the conversations with the mothers to be beneficial to her developing teaching philosophy. She wrote:

Something that I learned from the parents at [school] is that they were excited to talk to us about what they did with their children. ... If I can stay in contact with parents through emails and phone calls, I would be more comfortable asking them questions about activities they do in their community. I think this would be important because it would make a much stronger classroom. My students would feel this as well as myself. This would make my classroom feel like a safe and loving community.



Sophia found the conversation with the mothers to be a possible way to build a stronger classroom community that was “safe and loving.” She expressed a genuine interest in creating and maintaining a two-way dialogue with the mothers.

Kelly stated that the experience of having conversations with the mothers to be one that she planned to have with the parents of her future students. She shared:

I think a great approach is to build critical friendships with the parents from the start. Setting the stage for the year by asking parents to help educate their children through open dialogue will lead to a better foundation of trust between us. I will plan to use these friendships to learn about places in the community that families find important, topics of social justice that feel very present in their lives, and activities or interests that their children connect with. I will ask my students to have a similar relationship with me to help steer their education throughout the year. I think this understanding of teamwork and trust is important so that every party feels ownership over their role in education.

Kelly voiced the importance of building relationships with her students and their parents from the beginning as one that could support a learning environment built on “teamwork and trust,” and one that was respectful of parents’ knowledge and experiences. These findings support Colegrove and Krause’s (2017) work, which illustrates the importance of creating a bridge to “facilitate the exchange of ideas, concerns, and mutual support between the school and home” (p.3).

### **Minimize Assumptions**

Four of the PSTs reported that the conversations they had with the mothers led them to understand the importance of minimizing assumptions they might have about their students’

families. For example, after learning that one of the mothers was from El Salvador Angela shared:

Though I am Latina myself and find a great deal of similarities with the [school] community, I forgot how diverse the Latino community can be. One of the mothers was Salvadoran and it gave me a different perspective of the community we were about to serve. Additionally, I was reminded of the ignorance making assumptions can cause and reinforced the necessity to inform oneself of the community they are serving.

Angela's reflection demonstrates how inaccurate assumptions can lead to inaccurate conclusions about people. Additionally, Camille reported that assumptions might lead to erroneous understandings of students' out of school experiences. She stated:

First, I felt it was incredibly helpful to have the mothers at [school] to discuss ideas with us before we began our project. ... As a teacher, one cannot just *assume* he or she knows what the students are interested in or do on the weekends. ... Therefore, I will begin the year with both student questionnaires and home surveys for the parents. ... Tailoring my [mathematics] curriculum to the interest and relevancy of my student population is of utmost importance to me.

Camille's comment highlights her understanding and commitment of the importance of learning about her students' out of school experiences as a means to create relevant mathematics lessons. She envisioned that eliciting her students and their parents' input was key to accomplishing this goal.

### **Specifics Matter**

After learning from the mothers that their children and their family often spent time after school and on weekends playing soccer, one group of three PSTs created their mathematics

project around swimming at a local community pool. Thinking that the specific sport of soccer could be substituted for a mathematics lesson about a swimming pool, Anna stated that she learned in an “eye-opening” positive way that specifics matter. She shared:

A challenge is remembering that the same real-life examples don’t apply to every student, classroom, or community. A response to this would be to learn about the students in your classroom as well as the community. By doing this, you’ll be able to better tailor this type of mathematics teaching so that it is effective.

Anna’s “eye-opening” experience of discovering that the type of sport activity matters helped her to understand the importance of using specific out of school experiences in her mathematics teaching.

Maria shared how the conversation with the mothers about the specific places and types of activities that the families engaged in helped her to understand the importance of creating culturally relevant mathematics tasks. She spoke of the commitment she made to learn more about her students’ out of school experiences by having conversations with both her students and their families so that her mathematics teaching could be culturally relevant. She stated, “By creating culturally relevant tasks I will be letting my students know that I respect diversity in the classroom and want to make learning meaningful to them.” Both of Anna and Maria’s reflections suggest that the conversations with the mothers guided the PSTs’ understanding of the importance of learning about and leveraging students’ specific out of school experiences in their mathematics teaching.

### **Learning from Parents’ Perspectives**

All eight of the PSTs spoke of the importance of learning first hand from the parents about their children’s out of school experiences. Although the PSTs had the opportunity to learn

from their students about where they spent time with their family after school and on weekends as well as interview members of their students' community about the mathematics that occurred in specific community settings, having a formal sit down discussion with the mothers added another significant dimension to the project. For example, Anna stated that she found the conversation with the mothers to be "absolutely beneficial as we were able to learn about the community members and students. We were able to ask what the parents' interests were as well as the students." As Kelly reflected on the conversation that occurred with the mothers she shared the following thoughts:

While talking to the parents at [school], I learned that the places that held the most significance in their lives were places within the community, that were low cost and engaging for kids, or involved food and building community through meals. They were open about the fact that spending time with family was important to them and the community places they visited were places that offered whole-family interactions. These places included community parks and libraries as well as relatives' houses.

Kelly added that although the responses her students provided when she asked them where they spent time with their family after school and on weekends were the same as the parents, "the students' focus was less on their family time and more on places that were fun for them as children." Kelly stated the importance of gathering students' out of school experiences from the parents added a deeper dimension to knowing more about the value that parents place on family time.

Camille also learned from the mothers' point of view the value they placed on extended family gatherings. She shared:

I also realized by talking with the mothers that the families are a lot closer to their extended family than I am; it is a rare occasion that I get to see my grandparents, cousins, aunts, and uncles. These families got to see their extended family almost every week, or at times even lived with them.

Camille, like Kelly, reflected on the close relationships that the mothers placed on extended family gatherings. Both of these examples demonstrate the importance of teachers learning from both their students and their parents about where they spend their time outside of school. Without a conversation or input from parents, this type of relevant information would be lost.

### **Beyond the Classroom**

The conversations with the mothers prompted all eight of the PSTs to think more deeply about how they would learn more about their students, their families, and the community in which they would be teaching. Camille spoke of the importance of engaging in the “necessary research” to become acquainted with the community in which she would be teaching. Alba stated that she planned to spend time in her students’ communities so that she would have a greater understanding of the types of activities that her students and their families might engage in. Angela thought carefully about how she would be able to learn more about the students and their families in the community in which she would teach the following year. She stated:

One way in which I can do this, that I feel is quite authentic, is visiting the places where your students often go to. Simply getting to know the area and local businesses is a great way in starting to build bridges between the community and me, as the educator. Another way I might learn about my students, family, and communities would be attending events set up by the parent association or family oriented events hosted at the school. Spending time with families beyond the classroom can help build relationships and develop trust in

addition to learning more about the community and their culture. Doing so can also help me as an educator better serve my students and their families.

The reflections from these three PSTs suggest how powerful and far reaching the conversations with their students' parents can be. These conversations can serve as a catalyst for PSTs to think more deeply about the multiple ways they can make connections in their mathematics teaching to their students' out of school experiences.

### **Discussion**

The findings of this study offer an insight of the potential benefits of PSTs learning from parents. Our study reveals that all eight of the PSTs found that the conversation with the mothers provided them with a valuable opportunity to learn more about their students and their families as a means to support their mathematics teaching. For example, Alba stated that the knowledge she learned from the mothers about their children's out of school experiences would help to inform her future teaching of "meaningful learning experiences." Angela's reflection spoke of how the conversation with the mothers allowed her to incorporate the knowledge she learned and "build bridges" between home and school mathematics. Prior research has been concerned with ways to offer PSTs opportunities during their teacher preparation program to learn about students' out of school experiences (Author, 2007; Author, 2016; Banks et al., 2005; Foote et al., 2013; Kitchen, 2005; Turner et al., 2012). The findings in this study suggest that conversations that take place during PSTs' teacher preparation program between PSTs and parents can be a viable and valuable way for PSTs to learn first hand about children's and families out of school experiences. This type of experience may help to prepare PSTs to continue to have these valuable conversations with their future students' parents.

Our study demonstrates that inviting the mothers to attend a mathematics methods class as respected guest speakers provided an opportunity for the PSTs to view the mothers as valuable and knowledgeable resources who held an important and highly esteemed knowledge base of their children's out of school experiences. For instance, Angela shared that as a result of the conversation with the mothers she saw them as "experts" whom she could learn from, as she was not only learning to teach mathematics but also learning to teach in ways that connected to her students out of school experiences. Sophia stated that the conversations with the mothers positively impacted her developing teaching philosophy. Previous research documents the importance of challenging deficit-based views of underserved and diverse communities (Colegrove & Krause, 2017; Foote et al., 2013; González et al., 2005; Turner et al., 2012). Our study proposes that conversations between PSTs and parents in spaces that suggest "expert knowledge" (university classroom settings) provide an opportunity for PSTs to learn about the rich assets that parents from diverse communities possess.

Additionally, our findings have shown that the PSTs viewed the conversation with the mothers as an opportunity to support their students' learning by build trusting relationships with the mothers. Kelly spoke of how she planned to have ongoing dialogues with her future students' parents to learn about the places in the community they valued as well as the specific interests and activities of their children to establish a learning environment built on "teamwork and trust." Sophia described how the development of strong relationships with her students' parents could help her to feel more comfortable about asking them about their child's out of school experiences. This, she believed, could help create a "safe and loving community" for her students. Prior research has cited that that a major challenge that PSTs often experience in learning to make connections to students' home and community knowledge is the time needed in

order to build a trusting relationship with students and their families to learn this knowledge (Turner et al., 2012). Our study suggests that one way for PSTs to begin to understand the importance of creating a trusting relationship with parents is to have the opportunity to engage with parents during their teacher preparation program. This is especially important given the limited time PSTs spend in their assigned classroom and community during their student teaching assignment.

The experience of the conversation with the eight PSTs and the mothers reveals the importance of PSTs understanding that teaching mathematics that leverages connections to students' out of school experiences cannot be approached from a one size fits all perspective. Camille spoke of the danger of *assuming* knowledge about students' out of school experiences and as a result of the conversation with the mothers thought about additional ways to learn about her students' out of school experiences (i.e., questionnaires and surveys). The conversations with the mothers afforded Angela to see the diversity across the Latino community and understand how important it is to recognize the diversity so that "ignorant" assumptions are not made. Anna described her "eye-opening" experience of learning why specifics matter when creating mathematics tasks for students around a swimming pool despite the mothers sharing that their children played soccer. Thus, our research supports previous studies that confirm learning to incorporate children's experiences into their practice is challenging work for teachers (Author, 2007; Ball & Tyson, 2011; Downey & Cobbs, 2007; Foote et al., 2013; Kitchen, 2005; Leonard, 2008; Turner et. al, 2012). However, this study suggests that conversations between PSTs and parents about their children's out of school experiences may be a viable way for PSTs teachers to begin to learn how to make these connections in their mathematics teaching.

### **Implications for Teacher Education Research and Practice**



Our study focused on how a conversation with elementary PSTs and the mothers of children from an underserved community informed and influenced PSTs' thinking about how they planned to make connections to their future students' out of school experiences to support their students' learning. Given that this study centered on eight PSTs, future research might focus on a larger number of elementary teacher candidates including participants across different regional settings. Future investigation of this topic is important, as it might provide a deeper understanding of how PSTs begin to think about and design mathematics lessons that connect to children's out of school experiences.

Future research may also consider following new teachers who engaged directly with parents during their teacher preparation program into their first years of teaching to investigate how they elicit the knowledge of their students' parents in an effort to make connections to students out of school experiences. This line of inquiry would allow mathematics education researchers to examine if and how new teachers continue to take up practices demonstrated during their teacher preparation program (i.e. methods courses) that afforded them to learn directly from parents about their children's out of school experiences. Previous research reminds us that making connections to students' out of school experiences in their mathematics teaching a challenging but essential endeavor for student learning (Author, 2007; Turner et al., 2012).

Our study also reveals that mathematics teacher educators might want to consider providing time in their methods class for PSTs to learn first hand from parents about their children's out of school experiences. In addition to inviting parents to be guest speakers at a mathematics methods class, mathematics teacher educators might explore having PSTs conduct an individual interview with a parent as a means to enhance the experience of learning about children's home and community knowledge. Mathematics teacher educators may also want to

think about having PSTs enlist the expertise from parents to modify existing mathematics curriculum to tailor it to their children's out of school experiences. These types of explorations have the potential to alleviate the "mismatch between children's home cultures and the cultures of schools" (Rosebery, McIntyre & González 2001, p. 1).

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#### **Appendix A: Mathematics Project Reflection Questions**

What did you learn from the mothers about the types of places and activities they do with their children outside of school hours?

What surprised you if anything, about the conversation with the mothers?

What did you learn about yourself after having the conversation with the mothers?

How has what you learned from the mothers impacted how you will engage with the parents/guardians of your future students?

How has what you learned from the mothers impacted how you will teach mathematics in your future classroom?

How has this project impacted or shaped how you will teach mathematics to diverse students?

