Conversations With Family Members About Math

Regina M. Mistretta

Abstract

This article focuses readers' attention on how teachers communicate with families about math, what teachers specifically communicate about, and why the need to communicate with families exists in the first place. Findings from conversations about math facilitated by 72 teachers with 225 families of public and nonpublic elementary, middle, and high school students are reported to demonstrate how dialogue between teachers and families can support meaningful home–school interactions. Implications for teacher preparation programs and professional development initiatives are discussed, and recommendations for future research paths offered. In addition, prompts are included for readers' own reflection on using conversation as a form of practitioner inquiry for knowing and supporting families with math.

Key Words: teacher preparation, family engagement, professional development, mathematics education, homework, conversations, communication

Introduction

Students perform best when family members are part of the learning process. For example, Jeynes (2013) points out the strong connection between voluntary expressions of family engagement and positive school outcomes. Engagement of this nature includes reading with one's child, setting high expectations for academic achievement, and parenting styles that can improve

attendance (Sandefur & Wells, 1999), attitudes towards school (Centers for Disease Control and Prevention, 2012), and test scores (Strauss & Kohn, 2013).

Math attitudes and achievement are particularly noted as benefiting from home influences. For example, family members who pose thought-provoking questions or break down a problem into smaller, more manageable pieces support children in organizing their thinking (Walker, Shenker, & Hoover-Dempsey, 2010). In addition, home environments that nurture children's self-confidence help minimize math anxiety levels and, in turn, positively influence children's academic success with math (Vukovic, Roberts, & Wright, 2013).

Although family engagement clearly matters, opportunities for families to meaningfully engage in children's learning are sparse (Rivera & Waxman, 2011; Van Voorhis, 2011; Weiss, Lopez, & Rosenberg, 2010). In fact, the amount of discussion, rhetoric, and widespread agreement about the importance of family engagement far outweigh the actual degree of change in schools' practices.

Contributing to the situation are prevailing school-centric family–school paradigms that portray educators dictating passive family member roles such as monitoring children's behavior, school attendance, homework completion, and television viewing. Oftentimes, family members are positioned only as consumers of services and information from schools, rather than as active collaborators in shaping learning environments (Evans & Radina, 2014). Some go as far as to say that school practices for involving family members serve more as a form of public relations, rather than a means for cultivating meaningful partnerships with families (Knight-Abowitz, 2011).

Compounding these conditions is a consistent lack of teacher preparation. Even though federal and state policies call for equal partnerships between families and schools at a systemic level, attention to building capacity among all stakeholders to materialize such partnerships is lacking. Unfortunately, principals and teachers receive little training for engaging families despite the fact that family engagement is a high priority among school districts (Mapp & Kuttner, 2013).

Minimal attention is given to developing teachers' understandings about family members' views on learning objectives, as well as skills for meaningfully involving family members (Remillard & Jackson, 2006). In addition, school leaders' attention is unfortunately and disturbingly directed away from home–school relationship building due to the pressures of meeting state and national standards (Ferrara, 2009; Shirley & Evans, 2007).

If these trends continue, researchers warn that self-efficacy and authentic engagement opportunities are at risk of being undermined, especially for low-income and minority families (Hoover-Dempsey et al., 2005). Given the reformed mathematics curriculum materials and family members' lack of

familiarity with such materials, family members may resort to assisting children in ways that only mirror their own past learning environments, as opposed to that of current classrooms (Remillard & Jackson, 2006).

In this article, the author responds to the need for equipping teachers with mindsets and skills for supporting families with math. Specifically described is how practitioner inquiry opportunities (conversations with family members about math) embedded into a mathematics methods course informed teachers' practices for interacting with family members.

Findings from conversations facilitated by 72 teachers with 225 families of public and nonpublic elementary, middle, and high school students demonstrate how verbal dialogue enabled teachers to respond to circumstances surrounding the home. Surfaced themes among family members' voices are explained, teachers' responsive action steps described, and prompts offered for readers' reflection on using conversation as a form of practitioner inquiry for knowing and supporting families with children learning math.

The term family member is meant to include all adults who play an active role in a child's home life. Stemming from Calabrese Barton, Drake, Perez, St. Louis, and George's "ecologies of engagement framework" (2004), the term family engagement is defined as "a dynamic, interactive process in which families draw on multiple experiences and resources to define their interactions with schools and among school actors" (p. 3).

Literature Review

The empowerment of family members as knowledgeable school partners is further rationalized in this section. Theoretical frameworks, additional research findings, and the challenges of and recommendations for family engagement are described. A lens is focused on the quality of family engagement; a facet that hinges on how schools, particularly teachers, come to know and support family members. In addition, practitioner inquiry is showcased as a means for developing teachers' awareness of and responsiveness to circumstances surrounding the home.

Family: A Social Factor for Learning

The most basic premise of Vygotsky's sociocultural theory (1978) connects a child's intellectual development with his/her social environment. Vygotsky pointed out how this social environment contributes to the development of a child's higher order thinking skills when adults provide guidance within a child's zone of proximal development—a cognitive state in which the child cannot yet quite grasp a concept on their own and is responsive to social guidance. This social guidance is often referred to as "scaffolding."

Family members using this approach are attuned to the needs of the learner, guide the learner within his/her zone of proximal development, and readjust their assistance as the learner progresses to a new ability level. Guidance of this nature reflects what Hyde et al. (2006) termed "quality" assistance that is just as important as, if not more than, the quantity of assistance.

Building upon Vygotsky's work, Bempechat (1992) explained that families, as a unit of a child's social environment, have the capacity to implement practices at home that can influence both cognitive and academic socialization. Home practices involving cognitive socialization can either nurture or limit cognitive function; such practices include tutoring children at home from an early age and the level of control existing in the home. For example, excessive family control can limit children's self-esteem and, in turn, affect their level of cognitive development.

Academic socialization is how families cultivate school success in children. Joyce Epstein (1987) outlined six interrelated aspects of home behavior that positively affect school performance. These aspects are: (1) task structure (provision of intellectual home activities), (2) authority structure (level of decision making a child is allowed at home for the purpose of nurturing creativity and autonomy while fostering well-being), (3) reward structure (family recognition of advances in learning), (4) grouping structure (parent coordination of family and peer interactions), (5) evaluation structure (warm communication of home academic standards), and (6) time structure (home time scheduling that supports both school and nonschool activities).

Henderson and Mapp (2002) revealed that such family engagement practices have a major influence on children's achievement in school and through life. They reported that students with engaged families, no matter their income or background, are more likely to earn higher grades and test scores, enroll in high-level programs, be promoted, pass their classes, earn credits, attend school regularly, have good social skills, graduate, and go on to postsecondary education. In addition, Connor and Cross (2003) particularly noted the capacity of family members to positively influence academic success in math when they provide assistance that reflects the scaffolding approach described above.

Family Engagement: Challenges and Recommendations

Although family members can make a difference in a child's academic performance, they may face challenges when seeking to provide such support. This is particularly true when family members come from different learning environments, have low levels of formal education, or are from low-income communities. Strauss and Kohn (2013) pointed out that poor and less educated families can struggle with family engagement because of limited time due

to multiple jobs, trouble speaking English, and difficulty feeling comfortable in the school community.

In response, researchers underscore that communication with families must be two-way—not only consisting of schools feeding information, but also accepting information from families so as to acquire awareness of specific needs. Such treatment of families as partners, rather than clients, builds families' trust in schools and staff that is critical for meaningful partnerships to develop (Redding, Murphy, & Sheley, 2011; Wherry, 2010).

Shaver and Walls (1998) recommended that schools, especially schools for at-risk children, offer a variety of strategies to engage family members in order to support diverse needs. Balli and Wedman (1998) concurred and highlighted school guidance and encouragement as essential features for initiatives that seek to increase family participation with homework.

Galloway and Sheridan (1994) showcased the impact of initiatives that directly engage families in how and why children learn the way they do, reporting positive outcomes that included students' completion of and accuracy with assignments, particularly in math. Also related to math learning, Shumow (2003) highlighted the need for teachers to support families in providing less controlling and more exploratory assistance for children with the use of open-ended tasks that are free from clear, predetermined procedures.

Although recommendations exist, home–school barriers have prevailed for decades. Epstein (1986) reported parents viewing schools as well run, providing an overall good education, but not educating parents enough on how to support their children outside of school. More recently, Evans and Radina (2014) reported poor home–school communication conditions, with families rarely being asked to provide knowledge to educators other than contact information—conditions that can actually marginalize parents' perspectives and promote mutual distrust between home and school (Jeynes, 2010).

Civil and Bernier (2006) advocated for moving teachers away from this "deficit model," in which family members are underutilized and devalued, towards a mindset in which family members are valued as "intellectual resources" regardless of their economic, cultural, or educational backgrounds. Mapp and Kuttner (2013) also highlighted long-existing federal policy advocating for such a shift in family engagement through Title I of the Elementary and Secondary Education Act (ESEA) in its various iterations. Such policy requires schools to develop "school–family compacts" that frame how the two stakeholder groups can work together to improve student achievement.

The author of this article will describe how she used practitioner inquiry for developing such a partnership orientation. Specifically, she positioned teachers to shift their attention from what family members do to engage in their children's education to also determining the hows and whys behind their actions.

Practitioner Inquiry: A Means for Cultivating Home–School Partnerships

The decision to use practitioner inquiry, specifically conversations, to develop teachers' mindsets and skills for working with family members stems from the research findings and recommendations of several leaders in the field of family engagement. For example, Civil (2012) promotes practitioner inquiry as a critical step towards shaping support for families that responds to diverse circumstances, since family interactions can differ socially, culturally, and linguistically. Civil explains that practitioner inquiry offers teachers opportunities to tap into inherent funds of knowledge. Funds of knowledge refers to the accumulated social capital and skills used to navigate everyday life that family members can offer to children's learning (Moll, 1992).

Ferlazzo and Hammond (2009) also encouraged teachers and teacher leaders to inquire about families' resources as well as needs in settings reflective of trusting social discourse. Leithwood and Patrician (2015) concurred and underscored the value of building trusting relationships by listening to parents' voices as means for determining how best to build communication structures relevant to families' needs.

The national Parent Teacher Association, National Education Association, and researchers have advocated for similar frameworks for teacher preparation programs as well. For example, Bennett-Conroy (2012) called upon teacher educators to cultivate teachers' awareness of their role in communicating with family members and including family members in children's homework assignments in ways that are both meaningful and relevant to home circumstances.

The current author recognizes that shaping productive home support practices can be a complex and messy process. Several variables are at play, and there aren't always easy answers. However, as Abouchaar and Desforges (2003) stated, what families do at home is much more influential than any other factor open to educational influence. Hence, determining ways to support family interactions is critical; as portrayed in sections that follow, practitioner inquiry can serve as a worthwhile means for crafting such support.

Methods

Participants

During the timeframe of 2009 to 2014, 225 family members from 35 schools in the metropolitan area of New York engaged in conversations with 72 teachers. Of the participating family members, 95 were Hispanic, 63 African American, 47 Caucasian, and 20 Asian. Family members came from 35

schools; 23 were public schools, and 12 were nonpublic schools. Of the 23 public schools, 17 were middle schools and 6 were high schools. Families from the 12 nonpublic schools had children in Grades 3–5.

Twelve of the schools were located in Staten Island; there were six schools each in Brooklyn, Manhattan, and Queens, respectively, and five schools in the Bronx. All of the participating schools were classified as high needs. This classification was based on both economic and academic circumstances. The majority of students at each of the schools qualified for free lunch and were below grade level as evidenced through standardized test scores.

Of the participating teachers, 32 were enrolled in a graduate-level math methods course, and 28 teachers were enrolled in a professional development initiative. All family member and teacher participants were part of a privately funded grant program focused on developing the emotional quality of family collaboration with math. "Emotional quality" is used to indicate the level of supportive mannerisms demonstrated by family members when interacting with children—for example, how family members explain and explore math ideas with children (directive or guided), the types of questions family members pose (short answer, prompting, or probing), and the tone family members use when conversing with children (positive or negative).

Author–Researcher Perspectives

Acknowledging and responding to a researcher's stance in a qualitative project is critical because the researcher becomes the instrument by which data is collected and analyzed (Glesne, 2006). Since this author served as researcher, professor, and staff developer, she spent a substantial amount of time reflecting on her own subjectivity with respect to this project and its implications on her position as a researcher.

As a former elementary, middle, and high school mathematics teacher, this author employed a variety of strategies for engaging families inclusive of informational and collaborative hands-on family sessions, family projects related to real-life applications of math, and inquiries into how best to serve her classroom families. As a parent of a male and a female who have progressed through elementary, middle, and high school, she experienced, along with fellow parents, challenges associated with supporting children's math learning at home.

Such challenges concerned family members' anxiety over differing learning environments, school positioning of family members in passive roles, and misinformed views about school being the sole authority for children's learning. As a professor and staff developer, this author currently shares what she has learned in those roles as classroom teacher and parent with her preservice and in-service teachers to support their developing practices for working with

family members. In regards to data collection and analysis, this author expected her passion for investigating the hows and whys of family interactions with math to result in her reporting themes gleaned from participants' voices, even though those themes may have differed from her own expectations.

Throughout the course of research, this author acknowledged her own views about family engagement in math learning and guarded against inflecting her position into research data. Bias was controlled for by securing an external rater who analyzed all data and confirmed consistency between their findings and that of this author (Grbich, 2007). Themes were deemed reliable if the author and external rater achieved 80% agreement or greater.

Securing an external rater also allowed for peer debriefing and researcher reflexivity. Another effort to systematically attend to this author's context of knowledge construction was to show the results of the analysis to the teacher participants so as to incorporate member checking into the data analysis to help ensure consistency in data reporting (Creswell & Miller, 2000; Glesne, 2006; Grbich, 2007).

Data Collection

To investigate teachers' perspectives on supporting family members with math, this author administered a questionnaire she developed for the course and the professional development initiative. Three narrative response items queried teachers' (a) intentions for supporting family members, (b) concerns about supporting family members, and (c) views on how teacher preparation/professional development programs should prepare teachers to support family members.

To investigate family members' perspectives on children's learning of math, along with family members' engagement in that process, teachers facilitated conversations with family members using the following prompts:

- Describe your experiences concerning your child's learning of math.
- How do you perceive your role as a family member in your child's learning of math?
- How do you perceive the role of your child's teacher in supporting you, as a family member, with math?

These conversations were a form of practitioner inquiry that served to "look inside" the home and determine *how and why* families work together the way they do on math tasks, such as daily homework and projects.

Each teacher facilitated separate conversations with two, three, or four members from individual families as part of required coursework or professional development tasks structured by this author. Three of the 225 family conversations were conducted via phone; the others were conducted face-to-face.

When granted permission from family members, teachers would audio- or videotape conversations and later transcribe dialogue to promote flowing conversations. Teachers who were not able to audio- or videotape—or who found family members uncomfortable with detailed note taking during conversations—wrote abbreviated field notes. Directly afterwards, these teachers sat down to elaborate on those notes. In addition, the teachers were instructed on how to exercise member checking among their family member respondents to ensure accuracy, credibility, validity, and transferability.

Each teacher submitted field notes and contributed two blog posts after completing conversations. Teachers were required to use pseudonyms for family member names. Blog posts provided a means to (a) monitor teachers' individual findings, (b) provide opportunities for teachers to learn from each other, and (c) assess how teachers' practices for supporting family members with math developed.

First posts (each a minimum of 400 words, due a week after conversations were completed) were individual responses to the following prompt:

> Describe the information you gathered from your conversations with parents. Explain the implications, if any, of that information on your practice.

Second posts (each a minimum of 250 words, due a week after the first post) required each teacher to report on recurring findings he/she noted from reading course/professional development mates' first posts. A recurring finding was defined as similar responses among the majority of teachers. Second posts also required each teacher to explain (a) whether or not the recurring finding(s) was new knowledge, and (b) the implications, if any, of those recurring findings on his/her practice.

This author reviewed each teacher's field notes and related first post, as well as each teacher's second post. If inaccuracies surfaced, intervention occurred prior to making posts visible to the entire group to read. Interventions ensured that each teacher's (a) first blog post contained enough details, and (b) second blog post reflected a complete enough understanding of common findings so that the group learned from each other both virtually and during related face-to-face class meetings when findings were further discussed. For example, if a first post lacked description and/or available specifics, the involved teachers were requested to revise using more information and/or specific details noted in their submitted field notes. If specific details weren't evident in either a first post or submitted field notes, the involved teachers were requested to go back to family members and probe more about the information they initially gathered. In addition, if all existing recurring findings weren't noted in a second

post, the involved teachers were requested to reread first posts and resubmit their second posts.

Such management of blog posts afforded this author opportunities to facilitate face-to-face class discussions focused on common findings and specific details about those findings that supported teachers' collective professional growth. For example, teachers discussed family members' common concern over how their own learning environments differed from those of their children, a representative statement being:

> We don't know how to help our children anymore. The way I learned to approach certain problems is not how kids are taught to approach them today. The way kids are taught is more conceptual and inquiry-based, whereas we [family members] learned in a more direct way, sort of "here's how you solve this problem, now do it."

During face-to-face class sessions, teachers were able to share what they learned about family members' diverse needs. For example, teachers learned about family members' desire for (a) content knowledge, (b) use of manipulatives (concrete objects for understanding math ideas), (c) real-life applications of math to share with children, and (d) manageable timeframes so that collaborative projects/homework could accommodate family members' work schedules.

Once conversations with parents, blog posts, and related group discussions were complete, every teacher wrote a final written reflection. In this reflection, teachers stated their intentions for supporting parents with math.

Analysis

This author conducted open coding (Corbin & Strauss, 2008) and analytic induction (Bogdan & Biklen, 1992) on narrative responses to surface categories and themes among teachers' initial questionnaire responses, blog posts, and final written reflections. To determine any developments in teachers' practices for supporting parents with math, categories and themes that emerged from teachers' initial questionnaire responses were compared with those gleaned from teachers' blog posts and final written reflections. Throughout all analyses, triangulation was exercised to validate data, that is, cross verification of data stemming from teacher questionnaires, blog posts, and final written reflections was performed.

Three themes emerged from teachers' initial questionnaire responses concerning their perspectives on supporting family members with math, specifically, (a) passive roles for family members, (b) concern about a lack of family member support, and (c) desire for practical preparatory experiences working with family members.

Review of teachers' blog posts revealed themes among family members' voices coupled with teachers' responsive action steps with respect to (a) forms of family member support, (b) children's behaviors, and (c) home practices. Two categories surfaced concerning forms of family support, namely, content/pedagogical knowledge and communication.

Discussion of Findings

Teachers' initial perspectives are described first in this section to portray the teachers' mindsets prior to their inquiry work with family members. Discussion then shifts to the family members' voices that influenced those mindsets and informed teachers' responsive action steps. The explanations of specific developments in teachers' practices for working with family members that permeate the following discussion demonstrate the potential of practitioner inquiry to develop capacity for meaningful home–school interactions.

Teachers' Initial Perspectives

Passive Roles for Family Members

Initial questionnaire responses revealed teachers' overall passive mindset towards family members. For example, every teacher stated his/her intention to support family members by sending home content information to read. The majority of teachers (61%) planned to host family meetings. However, the rationale for such meetings was again for informational purposes only; teachers intended just to list for family members the math concepts and procedures taught throughout the year. No teacher expressed wanting to discuss methodology and related rationale with family members.

Thirty-three percent of the teachers indicated their intention to send home instructions concerning homework. However, the purpose for doing so was to provide single-method solutions to assigned examples. There was no mention of providing family members with ways to guide children's thinking process towards those solutions or to facilitate discussion about multiple methods of solution as was described above.

Calabrese Barton and colleagues (2004) also found limited practices for working with family members. They reported teachers just offering a "laundry list" of homework-related tasks "that good parents do" (p. 3) reflective of the deficit model noted above. Such efforts do little to meaningfully and purposefully engage families in exploratory interactions conducive to higher order thinking skills for math achievement.

Lack of Family Member Support

Teachers' initial high level of concern (94%) about a lack of family member support surfaced. Reasons included teachers anticipating family members' lack of content knowledge and limited language as factors hindering communication. Teachers acknowledged that children today learn math in a manner that is different from the way their family members learned; in turn, teachers feared family resistance to current methods of teaching math due to family members' unfamiliarity with it. Another factor fueling teachers' concern over a lack of family member support was their anticipation of family members viewing the school as having sole responsibility for educating children.

The teachers' concerns aren't unique; several years prior Marilyn Burns (1998) found similar perspectives. In addition, Konzol (2001) noted that teachers often misinterpret family members' low levels of engagement as lack of commitment. Hence, inquiry into the reasons for family members' actions, or lack of them, is important so as to minimize misinterpretations and maximize home potential through informed home support practices.

Preparatory Practical Experiences

With respect to what teacher preparation programs should do, the majority of teachers (72%) expressed a desire for opportunities to directly work with families to gain related knowledge and skills. Coupled with this desire for practical experience, teachers expressed interest in related mentoring from professors while they worked with families.

Learning about teachers' initial perspectives and desired forms of preparation for working with families validated the practitioner inquiry work this author crafted for shifting teachers' passive mindsets and concerns about family engagement toward acknowledgement of and support for family members as academic resources. This objective reflects the guidelines of the Dual Capacity-Building Framework for Family–School Partnerships (Mapp & Kuttner, 2013) that emphasizes the importance of teachers deeply understanding families so as to cultivate trusting home–school relationships with relevant and meaningful engagement practices.

The verbal dialogue that occurred between the teachers and family members allowed the teachers to directly interact with and learn from family members—experiences the teachers voiced as desired preparatory opportunities. In addition, both the blog postings and related in-class discussions provided forums for mentoring and collective sharing, conditions found to foster professional growth in a community of practice (Darling-Hammond & McLaughlin, 1995; Sawchuk, 2009).

Family Members' Voices and Teachers' Responsive Action Steps

Forms of Family Member Support

Content and pedagogical knowledge. Family members wanted to strengthen their own math content knowledge, as well as their understanding of how the content is taught in today's classrooms. In turn, family members requested explanations on how to solve homework examples and "easy-to-navigate" directions on how to guide children's thinking while solving those examples.

In response, the majority (83%) of teachers noted their intention to support family members' understanding of content as well as current methodology. This was a development from teachers' initially stated practices for supporting family members that focused only on distributing information to family members about topics taught at particular grade levels.

Specific action steps included teachers posting detailed solutions to homework problems for family members to follow online. Teachers did realize this might open the door to students looking at the answers beforehand instead of trying to arrive at answers themselves. This behavior was guarded against when teachers randomly called on students the next day to explain answers. Doing so confirmed students' understanding of the material.

Teachers informed family members that supporting children with math does not hinge on how much math family members know, but rather on the questions family members pose. Teachers provided families with good questions, reflective of classroom methodology, for guiding children's math thinking. These questions are those crafted by the National Council of Teachers of Math (NCTM) and are posted at http://www.nctm.org/News-and-Calendar/Messages-from-the-President/Archive/Diane-Briars/Back-to-School_-The-Time-to-Engage-Parents-and-Families/

Teachers recommended other online resources to family members such as IXL (www.ixl.com) and Khan Academy (www.khanacademy.org) to support content knowledge. Since family members may be unfamiliar with the characteristics of educationally appropriate websites, recommending such online resources was helpful. As a family member of a middle and high school student pointed out, "It's difficult for me to search for additional resources online. So much is out there, and I don't know which to pick."

This author integrated into class discussions the fact that lower-income families might not have access to technology. She recommended partnering with libraries where families can access the internet, videos, and librarian advice about which resources best suit individual needs (Guemsey, 2012). Such guidance reflects recommendations stemming from the Harvard (now Global) Family Research Project where public libraries are showcased as vital spaces for

helping families in steering, guiding, and supporting learning (Lopez, Casepe, & McWilliams, 2016).

The majority (61%) of teachers found a low level of familiarity among family members concerning manipulatives. Family members wanted both access to and training on how to use these tools. Teachers responded by recommending interactive online websites from the National Council of Teachers of Mathematics (http://www.nctm.org/Classroom-Resources/Interactives/). These online instructional tools utilize virtual manipulatives and provide detailed explanations to guide family interactions.

Communication. Family members requested more diverse ways for communicating with teachers about children's math learning, often because time was limited due to job-related reasons. For example, a family member told a teacher that she knew about her child's progress in math only through the school's online student assessment reports; she didn't have time before or after school to discuss with teachers the questions she had about her child's report.

In response, the majority of teachers (83%) noted their intention to communicate with family members throughout the school year. Noted practices went beyond conversations with family members at the beginning of the school year and at report card conferences, as initially intended. Specific developments included teachers emailing and/or phoning family members who faced time constraints. When communicating via phone, teachers called family members at their workplace during convenient times arranged in advance.

The phone conversations, although brief, allowed teachers enough time to share with family members how children were progressing along with ways children could improve. Family members appreciated this form of communication, noting that they were able to ask teachers specific questions and felt more "in the loop." Such outreach not only guides how the home supports the learning process, but also helps develop family members' sense of belongingness in that process—conditions found to increase parental engagement (Henderson & Mapp, 2002).

Teachers also started to distribute interactive newsletters to families. These newsletters included information about "classroom happenings" and invited family members to share "home happenings." This two-way communication provided opportunities for both teachers and family members to inform each other, opportunities reflective of Wherry's (2010) call for schools to also accept—rather than just feed—information to family members.

Teachers' initial anticipation of family members' unfamiliarity with how math is currently taught was confirmed. However, teachers were pleasantly surprised to discover that "family members do care" and want to communicate about math thinking at home with their children, even when time is limited.

In response to their discovery, teachers began to consider ways to work around time constraints. One teacher made this representative statement:

> I learned from conversation with some of my family members that they work late, and by the time they arrive home, they don't have enough time to go over homework in a way they would like to. This made me realize I need to create manageable conditions for families to interact on projects.

Acknowledgement of and responsiveness to this circumstance surrounding the home was encouraging to note, since willingness on the part of the teacher to accommodate the family can support the growth of a respectful and trusting relationship between home and school.

Children's Behaviors

Teachers became aware of reasons for classroom behaviors they hadn't known about prior to having conversations with family members. For example, seventh grade family members informed teachers that children weren't participating in class because they didn't want to "stand out as a math nerd" to peers.

Teachers also learned from middle school family members that children weren't motivated to learn math because they didn't see its relevance in real life. One representative family participant said:

> I've been hit with the question as to why math is necessary in life, and all I can come up with is banking and engineering. If you could give some examples of where math is used in everyday life, I might have a better chance of getting my kids to see the purpose for math.

Receiving this "inside information," as one teacher referred to it, influenced the majority (86%) of teachers to infuse more applications of math into classroom conversations. Careers that use math and popular figures in society who use math in their careers were integrated into classroom math discussions.

Other action steps included teachers charging family members at school meetings with promoting applications of math during conversations at home. Family members were also asked to give classroom presentations about the math they use at work. Such active roles for family members represented teachers' evolved perceptions of family members as academic resources, as opposed to teachers' initial views of them as passive recipients of information.

Teachers also learned how children resist family members' efforts to share different ways of approaching math problems. Family members reported hearing statements such as "This is not how my teacher told me to solve this!" and "We did it differently in class!" In response, teachers began conveying to students how discussing different approaches to solving math problems deepens everyone's understanding of the math involved.

Teachers assigned students a homework example to do with their family. Students were responsible for (a) sharing their approach with one or more family members, and (b) investigating their family member's approach. During follow-up lessons in school, teachers facilitated discussion among students that involved comparing and contrasting student and family member approaches, as well as looking for connections among the approaches. These action steps reflect the recommendations of Marta Civil, a leader of family engagement in math education (Civil & Menéndez, 2011).

Home Practices

Another enlightening moment for teachers came when family members spoke about how they learn from their children about math. A representative statement given was:

> Since I do not know many math terms or current ways of solving math problems, I ask my daughter to share how she solves math problems. I am actually learning a lot from her.

This type of feedback influenced the majority (61%) of teachers to think about ways to have children support family members' content knowledge at home. For example, teachers assigned students math topics to teach to their family member(s). Children were charged with (a) explaining a topic learned in school, (b) giving their family member(s) a related example to complete; (c) checking their family member's(s') answers and listening to their approaches; and (d) providing feedback to their family member(s). This proved beneficial; children had opportunities to review material learned in school, support family members' content knowledge, and have follow-up classroom conversations about math thinking that included family members' contributions.

Another discovery concerning home practices occurred when a teacher learned from a seventh-grade mother that she checks the school's website every day for homework assignments. Although an effective way to keep informed on its own, the mother would then organize a chart listing the homework assignments for her daughter. The teacher advised the mother to adjust this practice. Rather than the mother recording assignments, the teacher suggested that the student copy all of the assignments onto a chart herself and cross assignments off on her own as she completed them. This framework allowed the mother to monitor her daughter's homework completion as well as help her daughter develop self-regulatory practices. This teacher intervention, along with the others described above, reflect recommended opportunities for families to develop capacity for supporting children's learning (Mapp & Kuttner, 2013).

Conclusion

In this article, the author explains how teachers and family members learned from each other about meaningful and purposeful forms of family engagement. The findings shared demonstrate how practitioner inquiry, in the form of verbal dialogue with families, can position teachers to develop their knowledge of and responsiveness to circumstances surrounding the home.

Conversations with family members about math provided direct field experiences for teachers to develop diverse methods for engaging families that went beyond findings and recommendations they learned about from assigned readings. Specifically, teachers gained insights for tailoring family interactions with homework, supportive home resources, classroom discussions, home–school communication frameworks, and practices for supporting learning at home.

The way each teacher crafts how and what to inquire about will vary depending on individual settings. Essential, though, is that inquiry begins as a means for building bridges between home and school that make sense for all stakeholders. If conversations are challenging to facilitate at school, the teacher can consider crafting a questionnaire with items one wonders about then send home the questionnaire for family members to complete and return to school. One might also consider asking family members to complete a questionnaire at the beginning of a general school meeting or posing one or two questions at a school conference. Still another option is to make a questionnaire available online with the use of web-based resources such as Survey Monkey (www.surveymonkey.com).

This author continues to integrate conversations with family members about math into math methods courses and professional development initiatives. A colleague has adapted a graduate science methods course to include inquiry with families and is finding similar positive results. Several teachers described in this article transferred their learning experiences to colleagues; in turn, conversations with family members about math at their schools has become part of "doing business." Anecdotally, school principals have noted better school–family interactions and sharing.

Also important to note are the existing limitations in the work shared that warrant recommendations for further research. For example, adapting the teachers' blog post framework to include teachers responding to each other would deepen the depth of dialogue among teachers and provide additional data for determining teachers' collective professional growth. In addition, further data collection and related analysis according to grade levels would support understandings about differences or similarities among elementary, middle, and high school family members' perceptions and home support practices.

This article justifies practitioner inquiry as a means for shifting teachers' mindsets and practices for working with families. The next necessary research step is to investigate how such shifts transfer to advances in academic achievement and rates of graduation. Findings of this nature can further influence teacher preparation and professional development frameworks and validate the importance of deeply recognizing and supporting family members as stakeholders in the learning process.

References

Abouchaar, A., & Desforges, C. (2003). *The impact of parental involvement, parental support, and family education on pupil achievement and adjustment: A literature review* (DfES Report Research Report 433). London, UK: Department for Education and Skills.

Balli, S. J., Demo, D. H., & Wedman, J. F. (1998). Family involvement with children's homework: An intervention in the middle grades. *Family Relations, 47*(2), 149–157.

Bempechat, J. (1992). The role of parental involvement in children's academic achievement. *School Community Journal*, *2*(2), 31–41. Retrieved from http://www.schoolcommunitynetwork.org/SCJ.aspx

Bennett-Conroy, W. (2012). Engaging parents of eighth grade students in parent–teacher bidirectional communication. *School Community Journal*, *22*(2), 87–110. Retrieved from http://www.schoolcommunitynetwork.org/SCJ.aspx

Bogdan, R., & Biklen, R. C. (1992). *Qualitative research for education: An introduction to theory and methods.* Boston, MA: Allyn & Bacon.

Burns, M. (1998). *Math facing an American phobia*. Sausalito, CA: Math Solutions.

Calabrese Barton, A., Drake, C., Perez, J. G., St. Louis, K., & George, M. (2004). Ecologies of parental engagement in urban education. *Educational Researcher, 33,* 3–12.

Centers for Disease Control and Prevention. (2012). *Parent engagement: Strategies for involving parents in school health*. Atlanta, GA: U.S. Department of Health and Human Services.

Civil, M. (2012). Math teaching and learning of immigrant students: An overview of the research field across multiple settings. In B. Greer & O. Skovsmose (Eds.), *Critique and politics of math education* (pp. 127–142). New York, NY: Routledge.

Civil, M., & Bernier, E. (2006). Exploring images of parental participation in mathematics education: Challenges and possibilities. *Mathematical Thinking and Learning*, *8*, 309–330.

Civil, M., & Menéndez, J. M. (2011). Impressions of Mexican immigrant families on their early experiences with school math in Arizona. In R. Kitchen & M. Civil (Eds.), *Transnational and borderland studies in math education* (pp. 47–68). New York, NY: Routledge.

Conner, D. B., & Cross, D. R. (2003). Longitudinal analysis of the presence, efficacy, and stability of maternal scaffolding during informal problem-solving interactions. *British Journal of Developmental Psychology, 21*, 315–334.

Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Thousand Oaks, CA: Sage.

Creswell, R. K., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice, 39*(3), 124–130.

Darling-Hammond, L., & McLaughlin, M. W. (1995). *Transforming professional development for teachers: A guide for state policymakers.* Washington, DC: National Governors' Association. (ED 384 600)

Epstein, J. L. (1986). Parents' reactions to teacher practices of parent involvement. *The Elementary School Journal*, *86*(3), 277–293.

Epstein, J. L. (1987). Toward a theory of family–school connections: Teacher practices and parental involvement. In K. Hurrelmann, F. Kaufmann, & F. Losel (Eds.), *Social intervention: Potential and constraints* (pp. 22–27). New York, NY: DeGruyter.

Evans, M. P., & Radina, R. (2014). Great expectations? Critical discourse analysis of Title I school–family compacts. *School Community Journal*, *24*(2), 107–126. Retrieved from http://www.schoolcommunitynetwork.org/SCJ.aspx

Ferlazzo, L., & Hammond, L. A. (2009). *Building parent engagement in schools*. Santa Barbara, CA: Linworth.

Ferrara, M. M. (2009). Broadening the myopic vision of parent involvement. *School Community Journal*, *19*(2), 123–142. Retrieved from http://www.schoolcommunitynetwork.org/SCJ.aspx

Galloway, J., & Sheridan, S. M. (1994). Implementing scientific practices through case studies: Examples using home–school interventions and consultation. *Journal of School Psychology, 32*, 385–413.

Glesne, C. (2006). *Becoming qualitative researchers* (3rd ed.). Boston, MA: Pearson Education.

Grbich, C. (2007). *Qualitative data analysis: An introduction*. Los Angeles, CA: Sage.

Guemsey, L. (2012). Technology in early education. *The Progress of Education Reform*, *13*(4).

Henderson, A. T., & Mapp, K. L. (2002). *A new wave of evidence: The impact of school, family, and community connections on student learning.* Austin, TX: SEDL.

Hoover-Dempsey, K. V., Walker, J. M. T., Sandler, H. M., Whetsel, D., Green, C. L., Wilkins, A. S., & Closson, K. E. (2005). Why do parents become involved? Research findings and implications. *Elementary School Journal*, *106*, 105–130.

Hyde, J. S., Else-Quest, N. M., Alibali, M. W., Knuth, E., & Romberg, T. (2006). Math in the home: Homework practices and mother–child interactions doing math. *Journal of Mathematical Behavior, 25,* 136–152.

Jeynes, W. H. (2010). The salience of the subtle aspects of parental involvement and encouraging that involvement: Implications for school-based programs. *Teachers College Record*, *112*, 747–774.

Jeynes, W. H. (2013). A meta-analysis of the efficacy of different types of parental involvement programs for urban students. *Urban Education*, *47*(4), 706–742.

Knight-Abowitz, K. (2011). Achieving public schools. *Educational Theory*, *61*, 467–489.

Konzal, J. L. (2001). Collaborative inquiry: A means of creating a learning community. *Early Childhood Research Quarterly*, *76*, 95–115.

Leithwood, K., & Patrician, P. (2015). Changing the educational culture of the home to increase student success at school. *Societies, 5*, 664–685.

Lopez, M. E., Caspe, M., & McWilliams, L. (2016). Public libraries: A vital space for family engagement. *FINE Newsletter*, *8*(3).

Mapp, K. L., & Kuttner, P. J. (2013). *Partners in education: A dual capacity-building framework for family–school partnerships*. Austin, TX: SEDL, in collaboration with the U.S. Department of Education.

Moll, L. C. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. *Theory into Practice*, *31*(2), 132–141.

Redding, S., Murphy, M., & Sheley, P. (Eds.). (2011). *Handbook on family and community engagement*. Lincoln, IL: Academic Development Institute. Retrieved from http://www.schoolcommunitynetwork.org/downloads/FACEHandbook.pdf

Remillard, J. T., & Jackson, K. (2006). Old math, new math: Parents' experiences with standards-based reform. *Mathematical Thinking and Learning*, *8*, 231–259.

Rivera, H. H., & Waxman, H. C. (2011). Resilient and non-resilient Hispanic English language learners' attitudes towards their classroom learning environment in math. *Journal of Education for Students Placed at Risk*, *16*(3), 185–200.

Sandefur G. D., & Wells, T. (1999). Does family structure really influence educational attainment? *Social Science Research, 28*, 331–357.

Sawchuk, S. (2009). Staff development for teachers deemed fragmented. *Education Week, 28*(21), 7.

Shaver, A. V., & Walls, R. T. (1998). Effect of Title I parent involvement on student reading and mathematics achievement. *Journal of Research and Development in Education*, *31*(2), 90–97.

Shirley, D., & Evans, M. P. (2007). Community organizing and no child left behind. In M. Orr (Ed.), *Transforming the city: Community organizing and the challenge of political change* (pp. 109–133). Manhattan, KS: University Press of Kansas.

Shumow, L. (2003). The task matters: Parental assistance to children doing different homework assignments. *School Community Journal*, *13*(2), 7–24. Retrieved from http://www.schoolcommunitynetwork.org/SCJ.aspx

Strauss, V., & Kohn, A. (2013, February 6). Is parent involvement in school really useful? *Washington Post, The Answer Sheet*. Retrieved from http://www.washingtonpost.com/blogs/answer-sheet/wp/2013/02/06/is-parent-involvement-in-school-really-useful/

Van Voorhis, F. L. (2011). Adding families to the homework equation: A longitudinal study of math achievement. *Education and Urban Society*, *43*, 313–338.

Vukovic, R. K., Roberts, S. O., & Wright, L. G. (2013). From parental involvement to children's mathematical performance: The role of math anxiety. *Early Education and Development*, *24*, 446–467.

Vygotsky, L. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.

Walker, J. M. T., Shenker, S. S., & Hoover-Dempsey, K. V. (2010). Why do parents become involved in their children's education? Implications for school counselors. *Professional School Counseling*, *14*, 27–41.

Weiss, H. B., Lopez, M. E., & Rosenberg, H. (2010). *Beyond random acts: Family, school, and community engagement as an integral part of school reform*. Washington, DC: U.S. Department of Education. Retrieved from http://www.hfrp.org/publications-resources/browse-our-publications/beyond-random-acts-family-school-and-community-engagement-as-an-integral-part-of-education-reform

Wherry, J. H. (2010). *This parent involvement: Nine truths you must know now*. Fairfax Station, VA: The Parent Institute.

Regina M. Mistretta, professor in the Department of Curriculum and Instruction and associate dean at St. John's University's School of Education, has practiced in the field of education for three decades at elementary, middle, and high school levels, as well as at public and private institutions of higher education. Mathematics education, teacher preparation, and family engagement are her primary areas of teaching, research, and service. She also finds great pleasure in providing professional development for in-service teachers and administrators in PreK–12 public and nonpublic school settings. Correspondence concerning this article may be addressed to Regina Mistretta, Ed.D., St. John's University, 300 Howard Avenue, DaSilva Academic Center, Room 207D, Staten Island, New York 10301, or email mistretr@stjohns.edu