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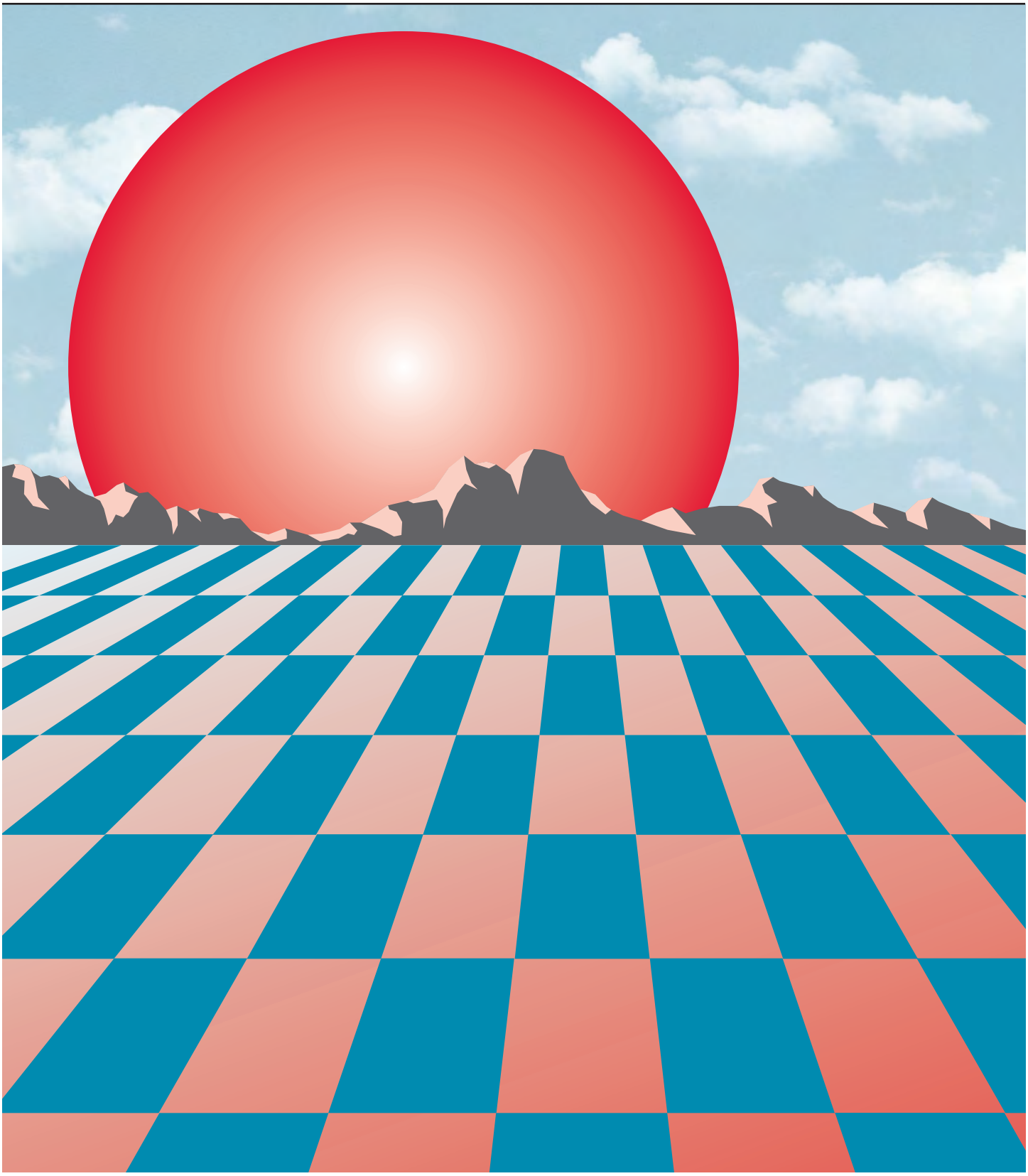

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Developing Capacity Within A School District To Bring About Change Through Professional Development

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ABSTRACT:

Teacher professional development is important for supporting teachers to change their teaching practices. However, the effectiveness of the professional development depends upon teachers actually making changes in how they teach. Teachers need support within their school settings to create these changes. Therefore, cultivating capacity within the institutional setting of the school district is an important component of professional development. This article examines how boundary encounters between district leaders, teachers and professional developers/researchers can develop capacity for change within an institutional setting. The role of district leaders as brokers within a professional teaching community and the district leadership community is highlighted. This analysis contributes to the discussion on how institutionally established boundaries of communication can be broken to increase the speed, flexibility, and integration of new and innovative ideas. This paper documents how district leaders, researchers/professional developers and teachers working together can generate knowledge and resources to create an environment for changing math instruction within the institutional context of the school district.

How teachers teach mathematics is influenced by the institutional context of the school district in which they teach. For example, a teacher is expected to teach from the district-chosen curriculum, cover particular content that is in the district standards, and even teach in a manner that is acceptable to administrators. Therefore, when supporting teachers through professional development to change their instructional practices to support student learning, we must understand and work within the institutional context in which teachers teach to create an environment for change to occur.

In this article, I explore the nature of boundary encounters between district leaders, teachers and professional developers/ researchers within a professional teaching community. A boundary encounter occurs when members from different communities engage in activities together. The purpose in doing so is to understand how we can design professional development that can create capacity for change. Therefore, an analytic framework for designing professional development is presented in this paper.

This paper will be organized as follows: First, I will briefly describe current reform efforts in mathematics education as envisioned by the National Council of Teachers of Mathematics (1989) and how professional teaching communities have been conceptualized in the research literature. The purpose in discussing professional teaching communities is because research (Franke, & Kazemi (in press); Grossman, Wineburg and Woolworth 2000; Lehrer and Schauble, 1998;Warren and Roseberry, 1995) suggests that it is an effective means of supporting teacher learning and generative teaching practices. A professional teaching community can be viewed as a community of practice. Therefore, I will elaborate upon the characteristics that make up a community of practice.

Next, I will examine how we could view a school district as being made up of "constellations of interconnected practices." Several communities of practice within a school district influence how teachers teach. Therefore, teaching

becomes a distributed activity (Cobb, McClain, de Silva Lamberg & Dean, 2003).

Understanding how different communities of practice function together through boundary encounters will help us understand how to develop capacity for change within the institutional context of the school district. An individual who interacts in more than one community can be considered a broker. Therefore, I will explore how brokers can impact innovation and change and enhance the boundary encounters that take place between communities.

The ability of new and innovative ideas to be developed and implemented in classrooms determines the success of the professional development efforts. I will elaborate how the quality of communication and the ability of an organization to leverage human and material resources is important for creating capacity for change as suggested in business literature. I will then present data and an analysis from a professional development/research project with middle school mathematics teachers on the nature of boundary encounters and the role of brokers.

Developing Capacity Within the Institutional Context of the School District to Create Change

PROFESSIONAL TEACHING COMMUNITIES AND REFORMED MATHEMATICS TEACHING

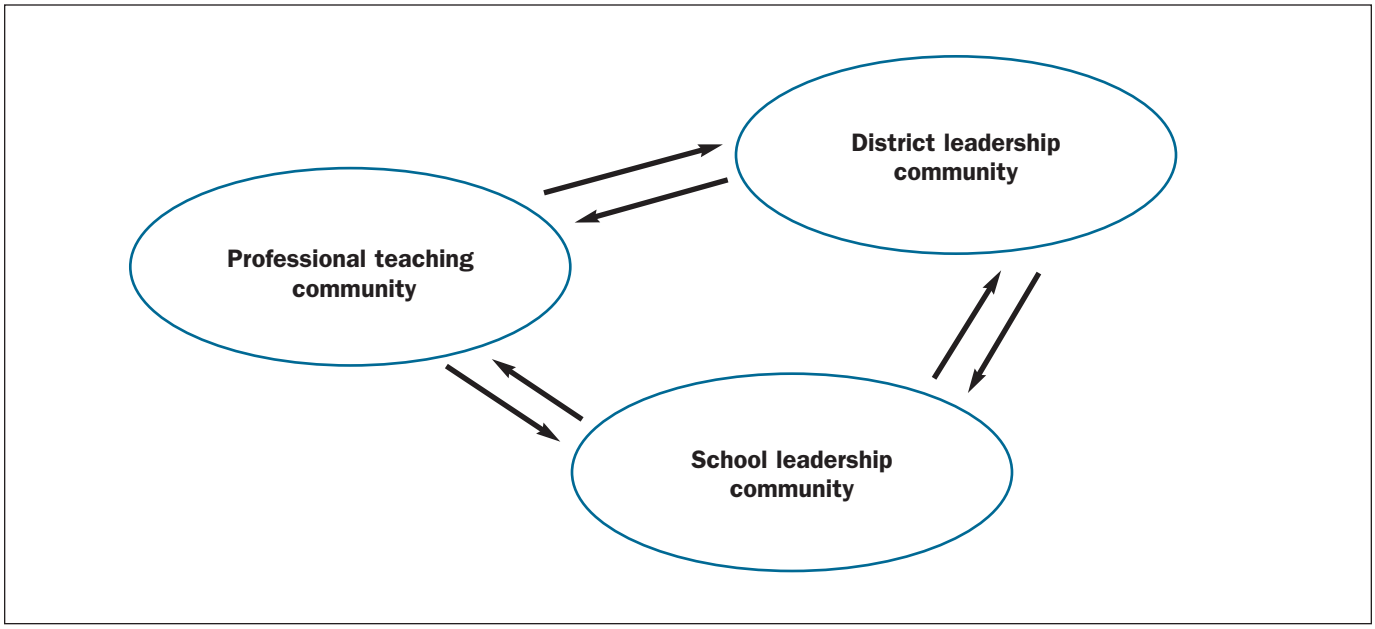
Recent reform efforts in mathematics education have focused on building conceptions of mathematics as a dynamic, socially constructed and inquiry-driven field (National Council teachers of mathematics,1989). Therefore, teaching that is consistent with the mathematics reform as envisioned by the National Council Teachers of Mathematics involves teachers developing generative teaching practices (Franke, Carpenter, Fennema, Ansell, & Behrend, 1998). Generative teaching practices involve teachers making pedagogical decisions based on student reasoning (Franke & Kazemi, in Press). Teaching for conceptual understanding is a complex activity because it involves figuring out how students are reasoning and making pedagogical decisions to support student learning by building on what students know and can do. A professional teaching community can become an arena for teachers to figure out how to support student learning by using each other resources A professional teaching community is a community of practice (Wenger, 1998) situated within the institutional setting of the school district. Typically, in the research literature, professional teaching communities have been conceptualized as a group of teachers working together with a group of researchers. (Franke, & Kazemi (in press); Grossman, Wineburg and Woolworth 2000; Lehrer and Schauble, 1998;Warren and Roseberry, 1995). Understanding how a professional teaching community is situated within the institutional context is important for understanding how boundary encounters with other communities impacts teaching.

SCHOOL DISTRICTS AS CONSTELLATIONS OF INTERCONNECTED COMMUNITIES OF PRACTICES

The institutional context of the school district can be conceptualized as being made up of several communities of practice designed to support instruction. For example, a school district typically has a centralized office, administrators and principals. These communities such as the central office (district leaders), building administrators (principals and assistant principals) and teachers have specific functions in supporting teaching and student learning. Each community can be viewed as a community of practice. According to Wenger (1988), an organization can be conceptualized as consisting of constellations of interconnected practices.

Cobb, McClain, Lamberg & Dean (2003) provide an analytic framework for understanding how teachers' instructional practices are influenced within the institutional context of the school district. The analytic framework is grounded in professional-development work with a group of middle school teachers. We discuss how mathematics instruction can be viewed as a distributed activity particularly influenced by district leadership community, school leadership community and math specialists. This is particularly the case with regard to how teachers organize for math instruction, and how math instruction is made visible. Furthermore, we describe how people in different communities interact with each other through brokers, boundary encounters and boundary objects. We discuss the role of brokers, how boundary encounters take place and how boundary objects are used to describe the interconnections that take place within various communities of practice. Figure 1 on page 47 illustrates how a professional teaching community, district leadership community and school leadership community function independently and together to influence teaching.

FIGURE 1. *School districts as constellations of interconnected practices*



COMMUNITIES OF PRACTICE

People who are part of a community of practice participate in activities through mutual engagement, negotiate meaning through a joint enterprise and possess a shared repertoire of tools (Wenger, 1998). This means that people within a community of practice have developed ways of interacting with each other and thinking that might be unique to that particular community of practice and unfamiliar to outsiders. Participants form close relationships and develop idiosyncratic ways of engaging with one another, which outsiders cannot easily enter. In particular:

1) They have a detailed and complex understanding of their enterprise as they define it, which outsiders may not share.

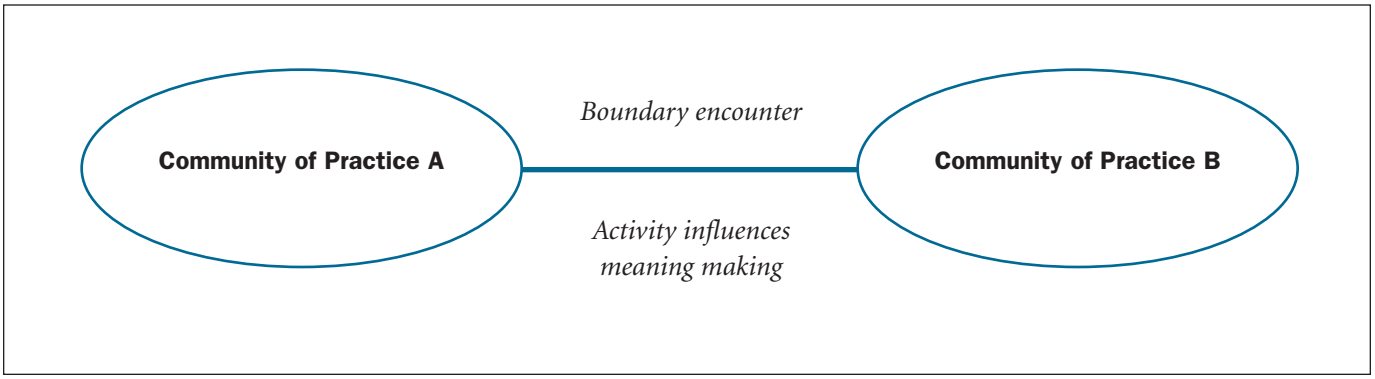
2) They have developed a repertoire for which outsiders miss shared references. (Wenger, p.113).

The nature of interactions between the communities through boundary encounters impacts the level and type of interconnections and relationships that exist between communities. The section below will elaborate upon boundary encounters.

BOUNDARY ENCOUNTERS

When brokers from different communities of practice interact through participation or reification, then a boundary encounter takes place (Wenger, 1998). A broker is a member from one community of practice who makes connections with another community of practice (Wenger, 1998).

FIGURE 2. *Boundary encounters between two communities of practice.*



A boundary encounter *(see fig. 2)* can take many forms such as meetings, conversations and visits (Wenger, 1998). The type of interaction that takes place during boundary encounters influences the meaning that is made between brokers. Ultimately, how respective communities align perspectives and meaning is influenced by the nature of the boundary encounter. For example, Cobb et al. (2003) provides examples of brokers within a school district engaging in boundary encounters, such as a principal conducting a drop-in visit to observe a teacher. This type of interaction involves an encounter between the teaching community and the leadership community. Boundary encounters can occur within a professional teaching community as teachers and brokers from other communities engage in professional development activities together.

An Organization's Capacity To Bring About Change Through Innovation

In this section, I examine business literature on how organizations develop capacity to bring about change. There are two themes that emerge from the business literature in relation to boundary encounters. These themes revolved around the nature of information or knowledge that gets shared or co-created, and also the ability of an organization to leverage material and human resources. The quality of these boundary encounters influences an organization's capacity to bring about change of innovative ideas. The same holds true in a school district setting.

According to Rogers (1995), organizations need to speed up the rate of diffusion of innovation within a social system so that change can take place. Communication that takes place within the social system of the organization and the sharing of ideas so that mutual understandings are developed influences the success of the innovation being adapted.

The nature of interactions between different communities and brokers can determine the quality of meaning that is made and mutual knowledge that is shared. The interactions through boundary encounters can remain at a very surface level or reach a deeper mutual understanding of each other's perspective. For example, when brokers from different communities of practice interact within an organization, they may interact with each other in their institutional hierarchical roles. A district leader may interact with teachers to provide professional development from a district leader's perspective of implementing wide scale reform, whereas, a teacher may interact with the district leader from a teacher's perspective. The understandings and goals of each community are different. Unless deeper communication takes place, the boundary encounters may remain at a surface level. A surface level exchange of information may take place, such as sharing of facts, instructions, procedures and artifacts.

From a business perspective, Ashkenas, Ulrich, Jick and Kerr (2002) discuss how organizational boundaries can be broken to increase speed, flexibility, integration and innovation needed to survive and thrive in today's business world. These ideas can be applied to working within the institutional context of the school district as well. They point out that, when people interact in their designed formal roles, the nature of their interaction may be rigid. This can cause a breakdown in communication and prevent new ideas from being generated. Therefore, when brokers interact, how they relate to each other and communicate issues and problems can lead to shared meanings. Speed refers to being responsive to customers in a market. Flexibility involves the ability of an organization to allow people to do multiple jobs and learn new skills. According to Ashkenas et al, role clarity constrains flexibility, especially when people are locked into specific roles and responsibilities and become unwilling to jump in a moment's notice.

Organizational resources need to be leveraged to bring about change as well. When brokers develop shared meaning and knowledge, they can leverage the organizational resources to make change happen. Gamaron et. al. (2003) point out those organizational resources can both enable and constrain activities of a group. They particularly referred to material, human and social resources. Therefore, when conducting professional development to bring about change in teachers' instructional practices, we need to leverage the organizational resources to bring about the change. This can only happen when brokers within the organizational resources develop shared meaning. Failure of innovation to be integrated through professional development may be attributed to failure of communication between brokers who are charged with system-wide change. On the other end of the spectrum, the interaction between brokers can develop negotiated meaning where ideas are shared and new ideas and meanings are negotiated. In this situation, brokers develop a shared meaning between the communities of practice.

The following section of a paper presents data from a professional development project that we conducted with middle school teachers. Our goal was to facilitate the

development of professional teaching communities.[1] Initially, teachers and researchers interacted together in professional development sessions. At a later date, we invited the district leaders to become part of the professional teaching community. This paper does not elaborate upon how we became a professional teaching community or the process by which the district leaders became part of the professional teaching community. Rather, I will focus on the nature of boundary encounters that took place between the professional teaching community made up of researchers, teachers and district leaders. I will focus on how the boundary encounters facilitated communication and leveraged organizational resources to develop capacity for change.

Methodology

The data presented in this analysis is from collaborations with a group of middle school teachers in a southern state for the past four years. A research team from Vanderbilt University had been meeting with the teachers once a month for six times during the school year and also during the summer for a workshop. We facilitated professional development sessions to help teachers develop generative teaching practices for mathematics instruction. Initially, the professional development sessions involved interactions between researchers and teachers. We wanted teachers to feel comfortable interacting with us. However at a later date, we decided to invite the district leaders to participate in the professional development sessions. The district leaders became part of the professional teaching community through their participation in the professional development sessions. It should be noted that it took 18 months before we could consider the professional teaching community as having a joint enterprise. Until that time, the interactions that took place during the work sessions fit what Grossman, Weinburg and Woolworth (2000) called pseudo-agreements that serve to mask differences in view points.

The school district where the study took place is an urban district that serves 60% minority student population. It is located in a state with a high stakes accountability program. The school district had received external funding to support reform of mathematics instruction. The district leadership community comprises a mathematics coordinator and 4 math specialists who serve 8 middle schools. The district leaders coordinate math reform in the district. The math specialists coordinate the professional development in the district and they also provide classroom assistance.

The data collected within the larger context of the study included videos of the professional development sessions during the school year and also the summer sessions from 2001-2003. The data also include interviews of the district leaders conducted by the research team.[2] The district math leaders interviewed include the math coordinator and the math specialist who worked with the schools represented in the professional teaching community. Detailed fieldnotes from each professional development session and interviews were recorded. The snowballing methodology (Spillane, 2000) and the constant comparative method of Straus and Corbin (1998) were used to collect and analyze the data.

The snowballing methodology used within the larger context of the project included semi-structured audio taped interviews with the teachers to identify how their math instruction was impacted within the institutional context of the school district. The issues addressed in these interviews included professional development activities in which the teachers participated, their understanding of district policies for math instruction and the lines of accountability, and their informal networks and official sources of professional assistance. Then we administered a survey to identify individuals who influence math instruction and conducted a second round of interviews to identify agendas relating to math instruction.

The Strauss and Corbin (1998) constant comparative method was used in the following manner. All professional development activities and formal and informal interactions with teachers, researchers and district leaders were chronologically documented. A matrix was created to record themes and key events that emerged from the data. Particularly, we were interested in the meaning that was made in relation to activities that took place in the professional development sessions and informal meetings within the institutional context of the school district. Emerging

[1] The research/ professional team consisted of Paul Cobb, Kay McClain, Teruni Lamberg, Chrystal Dean, Lori Tyler Qing Zhao and Jana Viskonovska at Vanderbilt University.

[2] Paul Cobb & Teruni Lamberg

themes that were categorized included the activities that took place during the professional development session, and teacher learning (mathematical and pedagogical), nature of relationship within the institutional context (teachers or district leaders), and reported affordances and constraints for teaching within the institutional context. I was able to examine the data chronologically and also across the matrix to examine boundary encounters that took place. The analysis of the data revealed the results discussed in the next section.

Results

As district leaders became part of the professional teaching community, informal relationships developed, shared meaning was constructed through participation and reification, and human and material resources were made accessible to bring about change within the institutional setting of the school.

• Informal relationships influenced the nature of communication

The informal relationships and friendships that developed between researchers, district leaders and teachers as the professional teaching community formed, influenced the type of communication that took place between different people. The initial communication that took place involved exchange of information. For example, the researchers were interested in understanding how the district was organized. Therefore, we asked the district leaders questions about the design of the institutional context and their formal roles as district leaders. We asked questions such as the district leaders' vision for mathematics instruction? What was the district curriculum and resources used? The district leaders shared information with the researchers during informal meetings. The initial exchange of information between the district leaders and teachers in the professional development sessions involved providing information about district-reformed curriculum, testing expectations and providing logistical support such as providing a space to meet.

As the professional teaching community began to form, the district leaders, teachers and researchers met informally for dinner and friendships began to develop. This changed how people communicated and interacted with each other informally as well as how they participated in the professional development sessions. An atmosphere of trust and openness in communication began to develop. For example, the district leaders shared with the researchers the challenges they faced when attempting to implement reformed curriculum within the district. The teachers openly shared constraints within the institutional context to support shifts in their teaching practices towards focusing on student understanding. They talked about the lack of joint planning time and the lack of instructional leadership from their school leaders. The researchers shared their analysis of the institutional context. The communication that took place was not constrained by the brokers' institutional roles for sharing information from a hierarchical structure of the designed organization of the school district. The comfort level contributed to the de-privatization of teaching and sharing of meaning across boundaries of the different communities of practice that was part of the professional teaching community. This was different than at the initial stages of the project. During that time, the teachers did not disagree with each other and they were concerned about how their comments would be construed by other members who attended the professional development sessions.

• Sharing of knowledge and information from multiple perspectives

As teachers, researchers and district leaders interacted during the work sessions; information and knowledge from respective communities of practice were shared. Therefore, issues and perspectives that were unique to the district leadership, teachers and researchers were shared within the professional teaching community that related to the joint enterprise of the professional teaching community. Getting the support of school leaders to become instructional leaders so that they could have joint planning time and support to teach for student understanding became part of the joint enterprise of the professional teaching community. For example, a discussion took place during the professional development session on how teachers could jointly plan lessons together so that they could problem solve and collaborate. The teachers expressed that there were too many demands on their planning time, and also that they worked in isolation with little opportunity to collaborate with each other. The district leaders listened to the teachers and expressed that planning time was a district wide issue. This is an example of teachers expressing constraints within their teaching community and district leaders communicating the district leadership point of view with regard to planning time. This gave the teachers insight that their isolation in teaching practices is not unique to a classroom or school, rather it is a district-wide issue.

Furthermore, the role of testing and its influences of teaching practices became explicit. These types of interactions also gave brokers the opportunity to find commonalities between the communities and also to develop a deeper understanding of the issues from different perspectives. The following conversation illustrates how ideas from various perspectives were shared and a joint understanding emerged within the professional teaching community.

Researcher: They (the teachers) have planning time but other stuff gets put in. In other words, it is not a high priority.

Teacher 1: Teacher workdays are mandates. This time gets used up with parent conferences…

Researcher: Why aren't the principals giving priority to instructional issues when it comes to it?

Teacher 1: Sometimes they turn information (on test scores) to us as they get it. My principal has made it clear that math scores and reading scores have to be raised.

Researcher: There seems to be differences between the schools. What do many of them (school leaders) think that teaching is about? It is not a problematic. . . The principals focus on class objectives and management issues and think that everything would work out. That was our conjecture. The principals view math instruction as pretty routine and it does not involve specialist knowledge.

Teacher 1: The principals think that if you give kids notes and have them learn it, the kids would be able to do the math. They don't focus on if kids really understand the concepts. The questions for the (standardized testing) require multi steps. Therefore, the teachers are expected to provide support.

District Leader: I think I disagree that it avoids understanding. There is a lot of understanding in the (standardized test). I think the test would reward thinking.

Teacher 3: The test should be shorter. They are not testing for understanding because they have so many questions. Rather kids are tested on their test taking skills.

Teacher 2: Are principals thinking of math teaching as routine activity?

Researcher: This fits with how many district administrators view math instruction. If you view math as continually trying to get a handle on kids thinking and adjusting, then math teaching is a pretty complex activity and there is a need for collaboration. If you form teaching with kids thinking in the center it is a different orbit. …However, the principals talk about math instruction in generic terms as real world issues, group work. However, their goal for math instruction with a focus on understanding has not changed. The teachers' goal is (student) understanding.

This conversation is an example of brokers from multiple communities sharing information within their professional teaching community related to the joint enterprise of the professional teaching community and their respective communities. In other words, multiple voices and perspectives of practices from the teachers, researchers and district leaders were shared. This type of sharing of ideas and perspectives helped the members of the professional teaching community to develop a shared understanding and understanding of multiple perspectives.

• ***Generation of innovative ideas that are jointly constituted***
New and innovative ideas for creating conditions for changing teaching practices within the school district were jointly constituted among the teachers, researchers and district leaders. For example, the agenda of the professional teaching community shifted to getting the principals involved as instructional leaders. The teachers wanted the principals to provide them with resources such as joint planning time so that they could collaborate and plan together to support student learning. The researchers, district leaders and teachers jointly constituted the process that they took to approach the principals. The researcher explained to the district leader that the teachers within the professional teaching community had interviewed 8th-grade students on some fraction tasks. It turned out that the 8th-grade students did not have a conceptual understanding of what "1/3" represented as a quantity. A discussion ensued, regarding the dilemma that if you follow the principals' directive, then you cannot adjust to students' reasoning, and so teaching procedures becomes ineffective. The following excerpts of the discussion that took place illustrate how ideas were generated to get the principals support to focus on students' conceptual understanding.

Researcher 1: If we agree that the different views that match teaching, and if you think it is important to

change their (school leaders') view and they see it valuable and it is in their interests. . . They (the school leaders) don't see any relation between that or (Standardized test) scores and what you are suggesting and we are thinking about the evidence.

District Leader: Using the vocabulary of (newly adopted program) would be a useful way to communicate to the principals etc.

Researcher 1: We have to speak their language that they understand in generic terms. The Superintendent really values the (new adopted program) design qualities. *(The researcher explains that he wants the understanding and memorization to work together because there is a strong correlation between the quality of thinking and how students are taught).*

Teacher 1: We should give the evaluating powers that be, (the) obvious examples of the (design qualities) of what we are working on such as linear models.

(Researcher 1 cautioned the teachers by saying the principals are going to understand these words from the perspective of their current understanding — i.e., a demathematized view of reform; the same traditional goals but different strategies.

Researcher 1: You have to prepare the ground so that they could have authentic problems.

Researcher 2: Just telling them to teach differently is not going to work.

Teacher: Just going through reformed curriculum is not enough. She needs to be able to explain to the principals why she needs to go to study groups.

Researcher 1: How you teach kids for understanding — you work on problems and situations hard to work on the reasoning? We have to put kids reasoning at the center.

Researcher 2: If you view mathematics as a routine activity, one way to approach the principals is to show that this way is not working.

(Researchers pointed out that the principals do not have to get to the same level of expertise as the teachers. But they need to get to some point so that they would be able to provide support. They added that these findings are consistent with the policy materials they have been reading.)

District leader: I think in middle school it is more a generalized view of instruction and if you keep order in the room and the kids are reasonably happy and the principals are in various places of with regard to integrated math. My goal is to have students learn meaningful mathematics for all students. Gifted kids have access to certain materials. *(District leader informed the teachers that there was going to be an administrators meeting with the school leaders and they might be able to communicate with them at that time.)*

The following ideas were displayed on a chart paper created by the teachers.

Where are the principals now?
- Teaching is a routine, sequential, predictable,
- Focus is on management and covering content.
- Demathematized view

Where do we want principals to be?
- Appreciate teachers' expertise knowledge
- Knowledge of kids reasoning
- Importance of understanding kids mathematical thinking
- Importance of collaboration to support, focus on student reasoning.

Researcher: One of the things you were talking about you working through a lot of the problems, what are you getting out of that the math point of view.

Teacher: figuring out what to do with kids' misconceptions was valuable.

Teacher 2: It is hard to have a conversation with yourself in isolation. When you are collaborating you get the initial goals of mathematics. You get to see what your kids are doing.

District leader: One of the things that we are doing with another researcher is a student interview. The teachers would get to view a student who scored high on the (standardized testing).

At this point, the teachers decided to try some tasks with students through interviews so that principals would get to observe student thinking.

The teachers, researchers and the district leaders jointly constituted the joint enterprise of the professional teaching community by sharing and negotiating multiple perspectives. The researchers provided insight on research on student thinking and policy, the teacher provided insight on how the principals view instruction and how they are held accountable, and the district leaders provided insights on how to communicate with the principals so that they could understand the goals of the professional teaching community. The professional teaching community reached a decision to get principals' attention to focus on student reasoning by having them observe students solving fraction tasks. They did this through a process that involved figuring out how to effectively communicate, how to implement the plan, and what the end goals would look like.

• ***Generation of material and human resources within the institutional setting to bring about change.***
Human and material resources became available and accessible as brokers from multiple communities participated within the professional teaching community. Therefore, the professional teaching community was able to take action to bring about changes within the institutional setting to influence math instruction. These resources were made available to further the joint agenda of the professional teaching community.

For example, the district leaders provided funding to send principals to visit another school district, which had school leaders who were instructional leaders. They did this because the joint enterprise of the professional teaching community involved supporting principals to become instructional leaders. This is an example of how material resources can be generated within the institutional context of the school district to further the agenda of the professional teaching community. In addition, the district leaders viewed it as a means to enhance their own knowledge to further their joint enterprise of providing professional development. The district leaders were particularly interested in understanding how the other school district incorporated teacher leaders to support math instruction.

The researchers were able to make arrangements for the teachers, school leader and a district leader to visit another school district. This is an example of how human resources are needed to generate change through the contribution of the researchers to coordinate meetings. In addition, the district leaders invited teachers to participate in district-wide decisions that involved mathematics instruction. As a result, the teachers began to have a voice within the district. This is an example of how district leaders and teachers within the professional teaching community had developed a shared understanding and became a resource for each respective community of practice.

Discussion

A community of practice that works together to bring about change is a community of action (Axelrod, 2000). However, a professional teaching community does not exist in isolation, rather it is situated within a "constellation of interconnected practices" within a school district. The effectiveness of a professional teaching community is dependent upon teachers being able to gain access to material and human resources to support change in their teaching practices. Therefore, we need to

- create capacity within the school district to support teachers implement innovative ideas and refine their teaching practices;

- reconceptualize a professional teaching community to include more brokers from other communities besides teachers and researchers/ professional developers, as described in the research literature (Franke, & Kazemi (in press); Grossman, Wineburg and Woolworth 2000; Lehrer and Schauble, 1998;Warren and Roseberry, 1995).

Furthermore:

- Researchers/professional developers must include math coordinators, math specialists; professional development coordinators as active parts of a professional teaching community. This is in contrast to interacting with them as peripheral participants.

Boundary encounters that take place between communities, such as the professional teaching community, district leadership community and school leadership community are the critical links that connect these communities together. The level of communication that takes place is critical for innovative ideas to be implemented and resources within the institutional context to be leveraged to create change. Different communities have access to different resources. For example, the district leadership community has access to material and human resources that teachers do not have direct access to. Furthermore, the sustainability of a professional teaching community is dependent upon material and human resources as well Gameron (2003).

The quality of relationships, trust and communication that take place through boundary encounters impacts an institutional capacity for innovation and change. The quality of boundary encounters between brokers is critical for an organization such as a school district to be able to integrate new and innovative ideas, as suggested in the business literature(Ashkenas, Ulrich, Jick and Kerr, 2002). As Wenger (1998) points out, people in a community of practice have unique ways of interacting and communicating with each other. This makes it more difficult for brokers to communicate without becoming part of another community of practice.

The boundary encounters that develop into mutual understanding and integration of multiple perspectives lead to more effective communication and action. The relationships that developed in the study aided the breakdown of organizational barriers of communication and the ability for members from different communities to openly discuss ideas and to communicate information back and forth. This afforded knowledge and information to travel quickly within the institutional setting. Therefore, there was a shift from teachers, researchers and district leaders working in isolation in discrete communities to working within networks of practice.

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