

— THREE —

RETHINKING BUILDING LEADERSHIP

STRENGTHENING RELATIONSHIPS THROUGH LEADERSHIP AROUND LEARNING

A PRINCIPAL'S JOURNEY

Speaking at a parent meeting, a principal asked, "How did we get to all this enthusiasm for math in our district?" He explained that in his 34 years as a principal he'd never been on a curriculum committee that worked so hard. Summarizing the process they followed, he said: "Instead of the textbook companies coming in and trying to sell us books, we went about this curriculum materials adoption as professional development. At the start I was not a believer in the new curriculum materials. My students were scoring in the 75th percentile—why would I risk these high scores and shift to another method if I didn't believe it would be better for children?"

"First we took a look at the TIMSS study (The Third International Math and Science Study) and knew we had to improve instruction. We learned that children in other countries were doing more with problem solving than our kids. It's not only the math content that's changing, but how the teacher is teaching. Instruction needs to be based on the research about how children learn. We were fortunate that NCTM standards were already formulated and that we have a lot of state resources including the Minnesota Graduation Standards and the Mathematics Frameworks. I know using standards-based curriculum materials is a better way to teach. After we learned more about teaching the standards and reviewed current research on learning, I thought, 'Wow! I've been missing it!' All of a sudden there was this big ray of sunshine in our district."

"Later we spent four days working with a Project 2061 tool comparing our two curriculum materials finalists and using criteria that helped us recognize what we needed to have. In the end, what one company said was in the curriculum materials wasn't really there, but the other finalist really held up. We had total consensus when we selected it as our choice. Now we have pilots going on in 32 district classrooms."

"I learned math the traditional way, and I supervised teachers from that perspective. One of the greatest things we are doing because of our curriculum choice, is we've begun training the principals. Most of us went to the regular training with our teachers, but as principals we are also learning how to do coaching. Frankly, the principals are learning it with the teachers. Professional development for the principals is so necessary."

"All this preparation with math will have a major impact on the literacy work we are doing and other subjects we teach. In my experience, this is the best professional training I've ever seen. Not only is it based on a solid research foundation, it's produced district-wide enthusiasm."

"Let us put our heads together and see what life we will make for our children."

TATANKA IOTANKS
(SITTING BULL, LAKOTA)

"Today the new mathematics of complexity is making more and more people realize that mathematics is much more than dry formulas; that the understanding of pattern is crucial to understand the living world around us; and that all questions of pattern, order, and complexity are essentially mathematical.

CAPRA, F., 1996,
WEB OF LIFE, p. 153.

District enthusiasm for mathematics takes considerable effort, as the anecdote above implies. The principal's description of taking the adoption of a new mathematics curriculum and turning it into an opportunity to study research on student learning, to examine standards-based education, and to rethink the role of principals was ambitious in its own right. Beyond that, to undertake such sweeping changes at the same time that principals are facing high-stakes testing, public pressure for school safety, and student populations that are both larger and more diverse, required skilled leadership¹. Besides improving student learning, principals are faced with changing policies, young teachers who need supervision, and diminishing resources (Hatch, T. 2001). In the end, principals have the paradoxical challenge to create a coherent instructional leadership model and at the same time manage increasingly complex schools. *How do building leaders reconcile their fragmented roles—to improve instructional leadership on the one hand and to manage multiple other building needs on the other? How do they adapt their leadership roles to better reflect changes in classroom practice? What resources do they use to bring parents' interests to bear on student learning?*

The collective accounts that participating districts gave of their mathematics implementations provide a lens on the changing landscape of school building leadership. As their buildings moved from piloting the curriculum to the challenging stage of building-wide implementation, principals encountered the uncertainty those curriculum changes would bring. Just as weather forecasting is confounded by various factors interacting with often unforeseeable outcomes, so too multiple, and often competing forces influence the work principals do. The reality of this uncertainty is evident as districts transition from traditional to standards-based mathematics instruction — boundaries blurred and old structures gave way to new relationships. Because no principal could fully anticipate teacher and parent response, the relationships principals developed with their teachers, the district centers, and parents required greater attention even as attitudes about their own leadership roles evolved.

INTERDEPENDENT FORCES

Within the ecology of schools lies a complex web of interdependent relationships². Study participants described the demographics of their student populations, the size of their buildings, and the economics of the times—not as separate entities—but all of a piece. Because no two districts had the same configurations or mix of variables, principals each approached their mathematics adoptions differently.

Regardless of the situations, however, every principal grappled with complexity and ambiguity. Common themes included:

UPDATE THE IMAGE OF TODAY'S SCHOOLS

The mental picture parents and the public have of schools often more closely resembles their own experience in school than it does the reality of schools today. Gone are the homogenous classrooms with desks lined up neatly, the teacher in the front of the class and principal in the office. In their place are a wide variety of school organizational structures serving students with a range of abilities, interests, and backgrounds.

• **VARIATION IN SCHOOL STRUCTURES** Depending on the growth or decline of school enrollments, or the distribution of new housing in large districts, the size and configuration of schools among districts varied widely. Unlike schools 25 years ago, today many schools serve large and increasingly diverse student populations. Said one principal, "I have a building with 700 kids and 45 certified staff." In this once rural district, population growth reflected increasing numbers of professional families moving further out from the suburbs and migrant families who were settling in the area. Population changes and economics affect not only building size, but also the configuration of grades from one district to another. In one district, zoning policy makes it difficult for families to move into the area because a new homestead must include 40 acres of land that, at today's market value, is simply out of the reach of young couples. As a consequence, the shrinking student population and associated loss of revenues have forced building consolidation. Since most mathematics curriculum materials are now written for the typical K-5 / 6-8-/ 9-12 grade patterns, principals who work in districts with alternative grade structures found their implementation complicated because some of their teachers were in separate buildings. In one district, with a grade set up primary (K-3), intermediate (4-6), junior high (7-9), and high school (10-12), the sixth grade teachers worked in a different building than their seventh- and eighth-grade colleagues using the same middle school curriculum materials. In another district with an elementary (K-4) and intermediate (5-8) configuration, the fifth-grade teachers were not in the same building as their elementary colleagues. In both cases, grade structures complicated the coordination of in-service training, as well as the possibility of finding common times for teachers to work together on their new curriculum.

• **POPULATION DEMOGRAPHICS** Grade and building structure may reflect dramatic population growth occurring within districts but other, less obvious changes, are also complicating the work of schools. In addition to economic and language

LEADERSHIP FOR LEARNING MEANS:

- working with teachers to develop academic content and pedagogical skills
- gathering and interpreting data to fuel academic achievement
- rallying parents and community around common goals of student performance

Adapted from INSTITUTE FOR EDUCATION LEADERSHIP,
2000: www.iel.org

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"There is no longer an average child—no typical learning-disabled child, no typical English language learner, no typical gifted child. Every child comes with his or her own set of needs and gifts and we are supposed to address them all."

PRINCIPAL

differences, children today display a greater range of learning and school-readiness than they did years ago. What is typical are classrooms that include children living in dysfunctional families, children who have physical challenges, or deep emotional scars. While some children are very talented and ready for school, some may have one or more developmental needs. At the same time more and more students aspire to and need to be prepared for post secondary education. Not long ago fewer than 20 percent of high school graduates went on to college in some of the participating districts. Today more than 50 percent expect to go on. And in districts where 50 percent went on to college 70 or 80 percent are going on. While the ecology of schools reflects changes in the communities they serve, the view people have about schools does not always keep up with the times. In the case of introducing standards-based mathematics, parents and public often fail to appreciate the value of mathematics instruction that is more accessible to more students at higher levels. With an outdated view of who our students are, how they learn, and what they aspire to, it is difficult for some to see the urgency behind changes in mathematics instruction.

RETHINKING THE ROLE OF PRINCIPAL

Meanwhile, even though principals are held accountable for student learning, they do not have control of many factors that affect learning (Borja, 2001)³. Some participants in the study said school size and increasing student diversity make it difficult to attend to the instructional aspects of learning.

- **IMPORTANCE OF INSTRUCTIONAL LEADERSHIP** All the participating principals agreed that instructional leadership is important, though some expressed frustration with their work. The principals from two small districts felt size compounded their jobs. One suggested that the problem is more complex than mere size: "I don't get to be the instructional leader because I don't have time. The problem is there are too many other things to do." Another principal longed for assistance with the myriad of administrative responsibilities. Discipline alone consumes enormous time in large schools. By way of contrast, one of the principals from a large suburban elementary school had a student services director to handle issues ranging from student discipline and business details to playground issues, which gave this principal the freedom he needed to attend to the instructional and supervisory duties in a large school. Two principals in another suburban district lead moderatey sized schools, but found the differences in their respective populations gave them each a different set of challenges. There is little doubt the principalship is changing, but how those changes will be

expressed in districts depends on a variety of factors. The solutions participating principals used in their mathematics adoptions offer some insights into the emerging shape of school leadership at the building level. As leaders, principals will need to help staff and parents work through the tension left in the wake of change.

INSTRUCTIONAL LEADERSHIP

Unlike mechanical systems made up of parts with discrete functions, schools are ecological systems dependent on relationships that operate within a whole. As the system changes, so do the relationships. During the implementation of their standards-based mathematics program, study participants described new dimensions in the relationship between principals and teachers.

LEADERSHIP ROLES

In spite of the difficulties with school size and changing demographics, principals in the study did not want to back away from their role as instructional leaders. Principals described various interactions with teaching staff during their mathematics implementation that reinforced their instructional leadership even as their relationship with teachers began to change.

- **SUPPORT TEACHERS** Several principals put priority on their traditional role of supporting teachers through supervision. Principals working in large buildings set aside a significant amount of time preparing for and supervising their large contingent of teachers. One principal had 16 probationary teachers that policy required him to supervise individually three times during the school year. He then had to squeeze in the rest of his staff supervision in the time that remained. He said, "I don't want to skip any of that, because it is the only chance I have to get into the classroom to see what's going on." Classroom visits brought home to one middle school principal the power of the new math curriculum. He said that whenever he was in a math class, all the students were not only on task, they were talking about mathematics and engaged in the problem at hand. "The difference in student engagement was dramatic, like you'd always imagined it could be," he said. In another district a principal cast himself as a resource for teachers. As opposed to a top-down management style, his satisfaction was drawn from seeing teachers "grow from here [hands held close] to here [arms spread wide]".

- **STAFF MEETINGS AS PROFESSIONAL DEVELOPMENT** Besides engaging with their teachers during supervision, some principals reported devoting portions of their staff meetings to discussions about mathematics standards and curriculum

implementation issues. In one district, a plan to provide on-going training about the math curriculum during staff meetings was followed in all district buildings. The plan had principals team up with piloting teachers who provided demonstrations and facilitated the discussions. “Principals here are standing side-by-side with our piloting teachers and this is changing the way we work,” a principal said. Teachers did not want to go it alone, said another principal. “I think they saw their position differently, and wanted to be along side with the principal.” Another characterized his role as the “watchful witness” suggesting that the staff doesn’t listen to what the principal says, “but they do pay attention to everything you do.” He backed his piloting teachers with support on many levels.

• **THE CHANGING ROLE** In spite of the persistence of these traditional duties, the principal’s role is changing. In another district, one principal described an emerging emphasis on teacher-leaders and their role in curriculum development as a factor changing how the principals saw their work. “The days of the principal as sole leader are dwindling,” he said. He suggested that moving from a top-down curriculum development approach to one that gives teachers ownership for their curriculum choices strengthens teachers’ convictions, but also appears to move the principal’s role off-center. More concretely, in one district a conscious effort was made to begin to shift principals from the role of supervisor to coach. “Once we saw how different the classroom strategies were, we were not sure about the details of our role as supervisor.” District leaders suggested to principals that if teachers were to become facilitators of learning, the principals needed to model facilitation.

• **PAINT THE BIG PICTURE** As schools began to implement standards-based mathematics, the instructional leader’s primary task was to move teacher practice away from the traditional stand-and-deliver model. Participants recognized that this major change in practice could not be mandated. Participating principals helped teachers understand what is at stake and how students who do not achieve mathematical proficiency lose out. “I try to talk with my staff all the time about keeping the big picture in mind. It is my job,” said one principal. In the past, literacy was the gateway to participation in the life of community and the rewards of work. When teachers understood that for the 21st century, numeracy is just as important as literacy to full participation in American life, principals gave teachers reasons to seek out and master curriculum materials that will help them make mathematics accessible for all their students.

“Instead of assuming people are inert and in need of motivation, a new view of leadership sees people as already in motion but in need of some way of guiding their action toward the creation of significance.”

DRATH, W.H., AND PALUS, C.J.,
1994, MAKING COMMON
SENSE, LEADERSHIP AND
MEANING MAKING IN A
COMMUNITY OF PRACTICE, p. 17.

CURRICULUM RESPONSIBILITY

Clearly the boundaries are beginning to blur between principal and teachers in the capacity of instructional leadership. While some of the principals saw their role in curriculum work diminishing, others saw it as integral to their work and wanted greater input and knowledge about the curriculum in their buildings. Principals recognized that in order to support and evaluate teachers, they themselves needed 1) to understand the math curriculum and 2) to align their supervisory patterns with current thinking about the relationships in a learning community⁴. When staff know that the principal understands, learning communities are possible.

• **INSTRUCTIONAL LEADER** One district principal said the culture of their district reaffirmed the principal's role as instructional leader. He said that new principals coming to the district found involvement in curriculum work a refreshing change. Principals were invited [strongly encouraged] to become deeply involved in the math implementation which meant, among other things, a commitment to attend SciMath^{MN}'s Teacher Academy for a full week early in the summer. One of the participating principals said the Academy was a real eye-opener; she understood that there was a lot more to the new mathematics curriculum than she originally thought. Another said that, besides helping teachers and principals learn about the various math curriculum materials, the Teacher Academy provided time for principals to focus on broader leadership issues. It also built in time for teachers and principals to work together as a team.

By contrast, a principal from another district wished she had been more involved during the mathematics curriculum decision and implementation. "Principals need to be more active than I was in the implementation itself," she said. She explained that today principals have to be more curriculum focused and need good background on math's new curriculum materials in order to assist teachers. "How can we expect to provide good support to the teachers and proper supervision if we don't know what it's all about?" she asked. In her district the majority of their implementation involved teachers in another building, and since only one grade level in her building was involved, she was on the periphery.

• **NECESSARY BACKGROUND** District curriculum and staff development leaders approached their principals' needs for background on the implementation of the standards-based math curriculum materials in several ways. In some districts principals were expected to attend the math trainings for teachers as much as possible. All principals and teachers in that district studied the *Best Practices* book and read *Beyond Arithmetic*. Another district brought the principals together with district curriculum

INSTRUCTIONAL LEADERS:

- PROVIDE COLLABORATION TIME during the school day and school year; "identify no-cost strategies" that help teachers work together.
- IDENTIFY CENTRAL QUESTIONS to guide the work of teams; assist teams in framing questions that focus on critical issues.
- ASK TEAMS TO CREATE A PRODUCT as an outcome of their work together; it is the best way to help teachers use their time productively.
- EXPECT TEAMS TO IDENTIFY AND PURSUE STUDENT ACHIEVEMENT; the driving force is improved results.
- PROVIDE TEAMS WITH USEFUL DATA; accurate data improves team effectiveness.

Adapted from
DUFOUR, R., 2001, *The Right Context, JOURNAL OF STAFF DEVELOPMENT*.

specialists “to experience the math” — district leaders wanted principals to know in a hands-on way what the math curriculum is about, and to be in a position to help teachers understand how to organize their time and space. For their part principals in that district appreciated the opportunity to “get on the same page” with each other so they would be able to send consistent messages both within their buildings and with parents. In particular, principals reported a desire to understand the research behind the curriculum and especially anything that demonstrated it improved student achievement. “If I want my teachers to be positive and clear about what they are doing, then I have to be positive and clear about what we are doing,” one said. In rural districts the involvement of principals in the math implementation, though informal because it often involved only one or two principals, was nonetheless considered important.

“In the end, no matter how much is written about instructional leadership being the pivotal factor in reforming math curricula, and no matter how many state and professional organizations are there with their wonderful assistance, there is a moment when principals and district leaders realize there is no one else to do it. It rests right here. The good, the bad, the whatever...and it isn’t always elegant.”

DISTRICT LEADER

• **LEARNING THE COACHING MODEL** Beyond understanding the new curricular content, one district believed supervision needed to change in relation to the standards-based mathematics curriculum. Portions of their monthly principals’ meetings were devoted to coaching strategies and skills. “We told the other principals they needed to change in order to look at classroom practices that are non-traditional,” said a principal on the math curriculum committee. A colleague recalls that at first, most of his fellow principals felt their understanding of coaching was adequate. The district leadership asked them to try a coaching supervision format in their buildings and report how it went at their next meeting. Most of the principals came back saying, “show me more.” One of the principals recounted that as she prepared for the pre-observation meeting with one of her teachers, she read the math lesson thoroughly. It was then that she realized just how much work the new curriculum was. “It helped me understand that it would take time for teachers to master the curriculum with a high level of comfort, and that we will have to encourage teachers to be patient. Otherwise they will go back to familiar patterns,”

she said.

• **MEETING TEACHERS ON A NEW LEVEL** A teacher observed that cognitive coaching was good not just for the math. “It will be useful for all our teaching, not just math, and especially important for new teachers.” She believed it would give teachers new to the classroom a level of support they needed and that she didn’t have when she began teaching. For his part, her principal observed that the coaching model gave him the framework to observe how the teachers’ own mathematical thinking was developing. In that district, principals deeply involved in the transition reported that they thought it would take two or three years before everything would go smoothly, and that their toughest hurdle would be dealing with the nay sayers who did not like the work the new

curriculum required. In the end, their willingness to grow professionally and become “students of the learning process,” allowed principals to meet their teachers on a new level. From there they could connect with teachers’ desires to make a positive difference in the lives of students (Dufour, 2001).

The strategies used in participating districts as they implemented their math curriculum materials suggest that more attention must be given to the role principals play in the process. Their involvement in curricular improvement requires supporting teacher learning on many levels. As the boundaries between teaching and learning blur and the relationships between teachers and principals change, what remains is that principals are still held accountable for school improvement, in this case, around the development of student mathematical proficiency. Principals are hired and evaluated based on their ability to understand and model instructional practice and thereby improve student achievement (Elmore, 2000, p. 13). The stakes are high.

PARENT CONNECTION

Because isolation is the enemy of improvement, it is left to the principal to connect all levels of the district—teachers, curriculum leaders, parents and community. Outside the building, principals serve as the master link between parents and district leadership goals for student achievement. While authentic parent involvement in the decision-making process was important for study participants, creating understanding among the general population of parents about the nature of standards-based mathematics began during the pilots and continued after the implementation was well under way. Even though teachers remained the parent’s first contact and trusted source of information, as schools moved into the implementation of standards-based mathematics, principals and lead teachers realized that parents needed organized, intense orientation to the new curriculum materials. They created a portfolio of resources to provide background knowledge, practical tools, and ongoing access that supported a desire to help their children learn. This cache of resources was a critical factor in the success several implementations experienced and, from them, three recommendations stand out: 1) bring parents in early, 2) create ongoing opportunities to increase parent understanding, and 3) boost parent participation to keep them connected with their children’s learning.

BRING PARENTS IN EARLY

When parents do not understand the nature of standards-based mathematics and the reasons behind its curricular changes, their lack of knowledge creates a void ripe

“I think it is hard for parents to understand that struggle is a big part of learning. I remember one parent who came obviously to challenge the program. It soon became evident that his older child was successful in the old method and now that child was frustrated because he was being asked to explain how he arrived at his answers. The parent did not want the child to have to work at the problems.”

TEACHER

for misinformation and fear. Bringing parents into the loop early and often not only ensures greater involvement in their children's learning, but fosters a home and school partnership as children develop proficiency in mathematics.

• **PARENT NIGHT GOALS** Principals in the study encouraged, supported and participated with their teachers in well orchestrated, interactive parent meetings early in the school year. They used a wide range of tools and techniques to bring parents up to date on current thinking about student learning, changing workplace expectations, and their important role in student success. Parents needed assurance that the new curriculum materials will teach high-level mathematics without neglecting basic math skills. All study participants recommended holding parent nights that accomplish three things:

PAINT THE BIG PICTURE—Parents need to understand the context—the reasons why mathematics education needs to change and why the new curriculum materials look the way they do. Research shows that students learn best when they build mathematical concepts through new experiences which enlarge their intellectual understanding.

RECOGNIZE PARENT NEEDS RELATIVE TO STUDENT LEVELS OF LEARNING—As the new curriculum materials were introduced, parents needed guidance on the best ways to help their children. Besides demonstrating how lessons work, teachers gave parents a heads up on what to look for and how to get the help they needed. Parents of children in the elementary grades often wanted to revert to the algorithms they learned as children instead of allowing children to puzzle through the mathematical concepts. In middle school, parents said they no longer know how to help their children because the approach is so unfamiliar. Participants in the study introduced parents to a variety of resources available for their use, and explained how they could coach students with their homework.

EQUIP PARENTS WITH IDEAS AND TOOLS TO HELP THEM

1. For those with students in elementary school, the games or activities that accompany the program are central to mastering basic skills and for showing young learners math's presence everywhere.
2. In addition, teachers used a bookmark with good questions parents could use to coach their students⁵. Familiarity with coaching techniques provides parents with students in middle or high school with a way to stay in touch with the student's learning. Because the curriculum teaches mathematical concepts in the context of extended problems, parents frequently felt at a loss. Given a set of open-ended questions, parents learned to help their children think their way through the work.
3. Give parents understandable data about achievement with these materials.

• **INTERACTIVE SESSIONS** The orchestration of parent nights required the same attention to learning theory as any classroom lesson. Instead of assembling parents in rows of seats to listen passively as one teacher or principal after another talked to them, most participating districts prepared sessions where parents were given time to engage new information, to reflect on their own experience and hopes, to talk with one another,

"The top five states in fourth grade mathematics achievement as reported by Education Week in its *Quality Counts 2000*—Connecticut, Minnesota, Maine, Wisconsin and Texas—have all been leaders in adopting the spirit of the NCTM recommendations for improvement."

NCTM BULLETIN (UNDATED).

and to try out some of the mathematics their children were learning. The most successful parent nights observed in this study were those that mixed up the format and allowed for plenty of talk:

BUILD ON REFLECTION—The Beloved Child exercise⁶, or some activity that helps parents reflect on their own school experience with math, served to bring the real experience parents had to bear on the issues. Because exercises of this type focus parent attention on the issues at hand, they help parents distinguish constructive elements from techniques that are obstacles to learning.

MAKE THE MATH VISIBLE—

1. Many parent meetings included some kind of group math activity that exposed parents to the larger math concepts their children were studying and the power of group thinking. Most parent sessions used activities sufficiently challenging to engage adults. After parents did the activity, the teacher-presenters drew connections between the activity and the work the students are doing in class. They explained how the lesson builds into larger mathematical concepts.

2. Teachers made effective use of student work using the samples to illustrate the deep mathematical thinking students employed. At other meetings, students themselves demonstrated problem solving and their ability to articulate their mathematical understanding. In both cases, when parents could see student work, their own understanding of proficiency in mathematics was clearer. Student work is very persuasive.

PROVIDE EXPERIENCE WITH THE MATH—Districts used a variety of videos to help parents see classrooms in action and to understand the relationship between teaching methods and student achievement. At one of the most successful parent meetings, the teacher leader asked parents at each table to watch for different ideas in the video.

"I showed the Marilyn Burns video," she said. "Parents at each table had a specific theme to look for and record on an overhead transparency. For example, one table listed the manipulative students used, another kept track of the questions that were asked." When the video was over parents from each table shared their list and talked about how these things contributed to student learning. Through discussions like this parents were learning from each other. Because past images filter thinking, in order to help people give up their old ideas about how classrooms work, it was important to give them new pictures as replacements. When parents led the video discussion themselves, new ideas were anchored more securely in their thinking.

LISTEN, LISTEN, LISTEN—Parents need sufficient time to ask questions and to hear answers. One school with high parent turnout had parents write their questions on cards. The principal grouped similar questions together, which were then answered by one or another of the teachers present. In another parent session, parents wrote their comments on post-it notes, one comment per note. Parents from the group sorted the comments into "plus", "minus" or "interesting." The parents summarized each group of comments and the teacher facilitator spent time commenting and engaging parents around their concerns.

During parent math nights, principals and teachers engaged parents' learning around the meaning of standards-based mathematics and its impact on their children's success. Through reflection, discussion and activities, parents learned that the curriculum

"If we don't show that the games are serious math, some parents, and even teachers, will think they're optional. In fact, students learn basic skills through the games."

TEACHER

USEFUL WEB SITES FOR SCHOOLS AND PARENTS:

- www.scimathmn.org
- www.nctm.org
- www.mtcm.org
- www.mathforum.com
- www.mathematicallysane.com
- www.gofigure.com
- www.edc.org

materials connect core mathematical ideas so that classroom math more closely represents the mathematics people actually encounter and use every day. Students investigate problems in real-life contexts that hold their interest. Students also explore the connections between mathematical ideas and their own personal experience through problem-based activities. In the process, they build mathematical ways of thinking, computational skills and the ability to work with others and independently. One principal said, “In a ninety-minute meeting, we can help parents see that we are teaching the same concepts they learned, but we are delivering the learning in another way. In the end, our goal is that their children have greater proficiency in mathematics than we ever had.”

CREATE ONGOING OPPORTUNITIES FOR PARENTS TO EXPERIENCE THE MATH

Saying that one parent night is not sufficient, principals and lead teachers strongly recommended creating continued, ongoing contact with parents as children grow through the new curriculum materials. Districts noted that transition grades were the most sensitive and needed greater attention. For students entering sixth grade who had traditional math all through elementary school, there was difficulty adjusting in the beginning and parents needed extended sessions on the middle school program. While most students and parents had adjusted by January, they did so as students attitudes improved, and as their own understanding of the math program’s potential grew. Many schools built ongoing contact with parents into their normal routines. Some examples include:

- **STRATEGIES FOR PARENTS OF YOUNG CHILDREN** Parents of elementary students, especially in the early primary grades, needed to know what their children were learning and how they were doing. In response teachers sent home weekly newsletters and updates along with math games or packets from the publisher. One district created a parent handbook with a glossary of terms, the philosophy behind the program, the scope and sequence of the math program, homework instructions, and other resources parents could use. Many districts distributed SciMath^{MN}’s bookmark with coaching questions parents can use to help their child think through their homework⁷. Some teachers made student folders that had games, helpful hints and other things that would give parents confidence and motivation to work with their children. Several of the new curriculum materials included strong parent communication components. In one, there is a portion of each lesson suggested for homework. The teacher said, “even though it is not time consuming, it is a good reinforcement to what happened in class, and at the same time keeps parents abreast of what we’re learning.”

• **FOR PARENTS OF OLDER STUDENTS** As children grew older and moved into middle school, parents' insecurity with the new curriculum increased, and with that their fears that their children were not going to be ready for higher math. The strategies some schools used to ease parent anxiety included using student work and portfolios during conferences to show a child's mathematical growth. In one building, parents attended a portfolio night. A teacher explained that her students pulled up some work on the computer and showed their parents some very high-level thinking. "One student showed her dad how a stem and leaf plot is used for graphing information," she said. Her colleague suggested that when students present information to parents, it's not only good for the student, "but parents are very impressed. They leave knowing their child is learning something valuable," she said.

• **SUPPLEMENT PARENT MATHEMATICAL BACKGROUND** Besides portfolios, one district reported increasing parents' mathematical understanding by providing a range of "Math Opportunity Nights." The sessions help parents grasp the contextual nature of mathematics while demonstrating the curriculum's alignment to graduation standards and the high school math yet to come. That district offers sessions including general homework nights, some designed around the use of graphing calculators and their place in the program, and some geared to be "whiz bang" demonstrations of the richness found in the new program, and to show how students with high math ability are challenged.

• **AVAILABILITY** Because it would be unrealistic to have all parents on board instantly, teachers in the study found they needed to be available to parents on a daily basis. "You need to be willing to answer the questions when they arise," said one teacher. She described a call she had earlier in the day with a parent questioning the value of having children explore multiple strategies to solve problems. "After explaining the thinking behind the method, I was able to show how children gain comprehension about the way numbers work and grow in their ability to judge the reasonableness of their answers," the teacher said. As children grow in understanding, she continued, they gradually use more and more efficient strategies to get the right answer. "In the end, students truly understand the mathematical concepts represented in the algorithms they are using," she said. Another way schools chose to be available was to use the internet to open conversations with parents and to have information and homework strategies readily available on line. "Beside using email to keep in touch with our parents, we hope to post new games on our web site and have hotlinks to other sites for parents who are interested in going deeper," one teacher offered.

MATH OPPORTUNITY NIGHT

One middle school holds sessions geared for parents at each grade level. Comments from among 132 sixth grade parents who went to one include:

- Very helpful to understand the binder and book.
- Thanks for providing this evening—we should have this again. Great ideas.
- Hints about how to encourage child by asking questions such as "Does this make sense?" were very helpful.
- This was a great math orientation. Good information.
- Next time have parents with child's own teacher.
- Can you influence other departments to do the same?
- Would be nice if it were done sooner. (The session was held September 19!)
- Would be nice to know how students were graded.
- I like the idea that more of our students will get further in math.
- Send home directions for the factor game, other handouts.

PARENT CONCERNS

Two of the most common concerns parents expressed had to do with:

- 1) Will my child learn the basic facts? and
- 2) Why don't you teach the procedures [algorithms] first?

From research we know:

- "Instructional programs that emphasize conceptual development, with the goal of developing student understanding, can facilitate significant mathematics learning *without sacrificing skill proficiency...*"
- "Students learn new concepts and skills while they are solving problems..."
- "If students over-practice procedures before they understand them, they have more difficulty making sense of them later."

HIEBERT, 1999, RELATIONSHIP BETWEEN RESEARCH AND NCTM STANDARDS, p. 11.

BOOST PARENT PARTICIPATION

The perennial challenge was to draw parents into the buildings and involve them in their student's work. The advantage of introducing standards-based mathematics was that it peaked parent interest and brought many of them into school; the disadvantage was they came with very different backgrounds and levels of mathematics preparation. Participants described parent attitudes and district responses to them.

- **THE RANGE OF INTEREST** Principals and teachers found that many parents did not set foot into the school. For some parents it is not a lack of interest. Parents from situations not typical of families in the past may need to be approached differently. "There's a lot of stress in some families and they don't have a lot of time to see that things are going well at school. They are trying to make ends meet and handle abusive situations all at once," said one fourth grade teacher whose school draws students from a shelter for families fleeing abuse. Many parents simply have low expectations for their kids. One teacher described the frequency with which parents take their kids out of school for family outings as a symptom that they don't think school is important. She suggested it is a problem throughout the system and thought parents who had a bad experience with school when growing up, were less likely to place great importance on student achievement goals now. And then there were parents whose math skills are weak. "I have some parents who say they don't understand the homework, and I've come to realize that the parent's own math background was probably very limited," said one teacher.

At the other end of the spectrum, parent participation tended to be high in affluent neighborhoods and areas with populations of professional or highly educated parents. In one district the principals said, "The parent climate in this district is focused on acceleration." In response the district has created a series of extensions to supplement their curriculum and they have oriented their teachers toward providing a "developmentally appropriate and differentiated instruction" in every classroom. Vocal parents expressed high demands for their children and their schools. Parent participation was an explicit expectation in a different district's magnet school. The kindergarten teacher said that about half the parents are in her classroom every day helping one way or another which makes having extra math meetings almost unnecessary: "They see the math and have few questions because they have so much exposure to it on a daily basis," she said.

- **IMPROVING THE ODDS OF ATTENDANCE** Districts used both simple and more complex strategies to improved parent attendance at their meetings. While no one had 100 percent of the parents involved, principals and teachers believed that the more they

connected with parents about the new standards-based curriculum materials, the greater the long-term success of the math programs. Some strategies they used include:

TURN OUT FOR INITIAL PARENT NIGHT

- Some principals encouraged K-5 teachers to call and personally invite each parent to the meeting.
- For middle school parents, one district prepared an invitation that stood out as different from the typical school communication. They set up six different parent meetings for different times, different days of the week and encouraged parents to attend the one that was most convenient, even if it was not in the building their child attended.
- Another strategy used by some districts was to attach the math meeting to a high-attendance event at the school. “We always have high turnout for our curriculum night, so this year we tacked on a math meeting at each grade level. It worked because most parents stayed,” said one teacher.
- Another school had breakfast meetings to introduce parents to Minnesota Graduation Standards that resulted in unexpectedly high parent turnouts. This principal planned to repeat the same format when they introduced parents to the standards-based math curriculum.
- One first grade teacher invited parents to a morning math meeting-class that ended with parents joining their children for lunch. She had 75 percent participation. Parents observed as she began a typical lesson with her students, they worked with their own child on a problem, listened to children explaining their strategies, and saw how components of the lesson built understanding and encouraged student participation. When the children went off to music, the teacher engaged parents in a discussion about what they saw and what they wanted to know.

THE INVISIBLE NETWORK—During the implementation of a secondary standards-based mathematics program, one district relied on the “invisible parent network.” While only 20 percent of the parents of eighth grade students attended the parent meetings, 95 percent elected standards-based mathematics for their high school math program. A few weeks after the parent meeting, district leaders conducted a brief survey during parent conferences. In response to a question asking whether parents did or did not attend the meetings, of those who did not come, the majority had a conflict but most also said they trusted the judgement of the teachers. One teacher observed that the parents who do not come to school meetings tend to touch base with other parents who do. Parents tell each other what they think. The overwhelming choice parents made for the new curriculum suggests that the positive experience some parents had at math meetings was magnified through word of mouth. Other contributing factors included parent belief that the new curriculum materials would help their students meet the graduation standards efficiently.

Regardless of grade level, on-going parent contact meant being accessible to parents. Teachers and principals alike said availability to parents one-on-one to address their questions was important. Teachers described their willingness to handle phone calls or meet with parents and, though they found themselves repeating things covered in larger meetings, they understood that not all parents are ready at the same time to hear

OTHER PARENT QUESTIONS

Facilitators for parent night sessions might want to prepare for typical questions encountered by study participants:

- **READING:** Will this curriculum disadvantage children who have difficulty with reading and language skills?
- **GROUP WORK:** How will you ensure all students are learning, that my child is not slowed down by being in the group? How much group work is there?
- **GRADES:** How are children graded—especially for work done in groups?
- **RESEARCH:** What is the research that supports this curriculum? Will my child’s college entrance be jeopardized?
- **CLASS SIZE AND TECHNOLOGY:** How does a teacher manage this work in large classes? How is technology integrated into the program?

what is being said. Overall, elementary school parents asked for ways to help their children with math homework, to understand how the games reinforce basic math skills, or how challenging problems develop high-level thinking. In secondary schools, in addition to homework meetings, schools held sessions to bring parent math skills up to date.

LEADERSHIP FOR LEARNING

Gone are the days when principals were measured solely by the effectiveness of their building-management skills. Though running smooth operations continues to be a significant part of a principal's job description, today school building leaders must also serve as leaders for student learning. Not only do they need familiarity with content matter and teaching methods, they must work with teachers to strengthen their skills, understand the research that supports student learning, and unite parents, teachers and community members around improving student performance (IEL, 2000).

As our study showed, principals were challenged in their task of creating a coherent instructional model centered on learning by the demands of managing increasingly complex schools. They learned that public perceptions of schooling needed to be aligned with the new reality of schools today. Economic policies driven by the efficiency of size no longer serve the diverse needs of students today. In most districts, the implementation of standards-based mathematics increased stress as people struggled to absorb new ideas. First, the new curriculum materials highlighted changes in the way instruction is delivered and the need for increasing teachers' mathematical content knowledge. The boundaries of instructional leadership blurred as principals relied on *partnerships with teachers to deliver ongoing staff development and engage parents with the new curriculum materials*. Consequent to this new partnership with teacher leaders, principals adjusted their supervisory practices more consciously along the lines of cognitive coaching. Because isolation is the enemy of improvement, principals supported engagement with parents early and often in the implementation process. Second, leadership for learning meant *keeping everyone focused on the meaning of student mathematical proficiency*. One curriculum leader said that many principals wanted to know the practical things such as, "How do you handle the parent who just called?" or "How do you get your teachers to take the next step?" She said "Instead, principals have to figure out how they can widen the circle and center it around a common goal." If the ecology of schools is a complex set of relationships, the principal's task supports that web with multiple opportunities to engage parents, teachers and the public in a new understanding of the changing landscape of learning.

All this leaves principals where they often are—squarely in the middle, trying to reconcile state and district mandates with the wishes and needs of local stakeholders....The most perplexing task for school leaders is providing the right kind of leadership — leadership that shares authority and accountability with teachers and students and helps everyone meet the challenges before them."

LASHWAY, 2000, *WHO'S IN CHARGE; THE ACCOUNTABILITY CHALLENGE, PRINCIPAL LEADERSHIP*.

Principals uninvolved, or minimally involved, in the implementation recognized that without the fundamentals of content and pedagogical knowledge inherent in standards-based mathematics, they are unable to provide the support and facilitation their teachers needed. What's more, because principals are held accountable for improved student performance, those who remain isolated from the core aspects of implementing the new curriculum materials may find their ability to understand and model instructional expectations severely weakened, and they may lack fluency when parents and community members pose questions.

In the complex ecology of today's schools, as the boundaries of responsibility blur, the vital role principals play in connecting teachers, parents and community to the common goal of student achievement in mathematics cannot be ignored. Beyond the technical aspects of operating schools, leadership for learning means focusing on critical questions and ongoing exposure to new ideas, while at the same time managing the tension by pacing those ideas within tolerable limits. The heart of a principal's work centers on sustaining professional learning communities that bring teachers and parents together with high expectations for student mathematical proficiency⁸.

DISCUSSION QUESTIONS

1. Who has responsibility for curriculum decisions and implementation in your district and what role does each person play? Are all "voices" included?
2. Who should have instructional leadership roles in your district and what kinds of training might you employ to make sure new curriculum materials are well supported?
3. What role or roles would you like to see the principal assume? What can you do to make it happen? (If you are a principal in this discussion, how do you see yourself as a leader in the adoption and implementation of a standards-based mathematics program? What new roles might you want to assume?)
4. How will you connect with parents? What strategies have you used successfully in the past? What new strategies might you consider? What concerns do you think parents will have that must be addressed?

ENDNOTES - RETHINKING BUILDING LEADERSHIP

1. Elmore (2000) defines improvement as "change with direction" that is sustained over time and that moves entire systems to raise the average level of performance. He suggests that instead of principals who function as buffers that solve the daily problems of school, they reclaim their roles as leaders in instruction, and orient their other work around that (p. 14-15).
2. A report from the Institute for Education Leadership's Task Force studying the principal's job said that "the principal of tomorrow will lead diverse schools, subject to volatile change and focused on achievement. As centers of the community, principals will need to be an instructional leader, a community leader capable of sharing the big picture of schools—an advocate and community partner—and a visionary leader whose energy and commitment motivates others in and outside the building in the belief that all children can learn." www.iel.org.
3. In an article entitled *Growing Your Own*, the author describes the coming shortage of principals in the context of increasing professional responsibility, and mediocre salaries. He quotes the executive director of Virginia's Association of Secondary School Principals, "The frustration level for principals is at an all-time high. We're caught in a time warp. We're launching a new era of accountability, but we're doing it with a Model T Ford mechanism...The support is not in place for principals to be instructional leaders."
4. Brad Board (2000) links improved student achievement to the principal's role: Among other things, he suggests principals need to be well informed about the big picture of change, be knowledgeable regarding best practices and research on student learning, be able to work with curriculum committees and the community to bring about long-term, systemic change in mathematics instruction, and actively participate with teachers and curriculum committees to promote changes in mathematics.
5. Visit SciMath^{MN}'s web site for information on tools that help parents adjust to the new standards-based curriculum materials : www.scimathmn.org
6. A description of The Beloved Child exercise can be found in SciMath^{MN}'s *Minnesota K-12 Mathematics Frameworks* in chapter one and in part one of this report.
7. See SciMath^{MN}'s website: wwwscimathmn.org.
8. "I have also come to understand that the context principals should strive to create in their schools is the collaborative culture of a professional learning community. Creating a collaborative culture has been described as 'the single most important factor' for successful school improvement initiatives, 'the first order of business' for those seeking to enhance their school effectiveness...and the most promising strategy for sustained, substantive school improvement" (DuFour, 2001).