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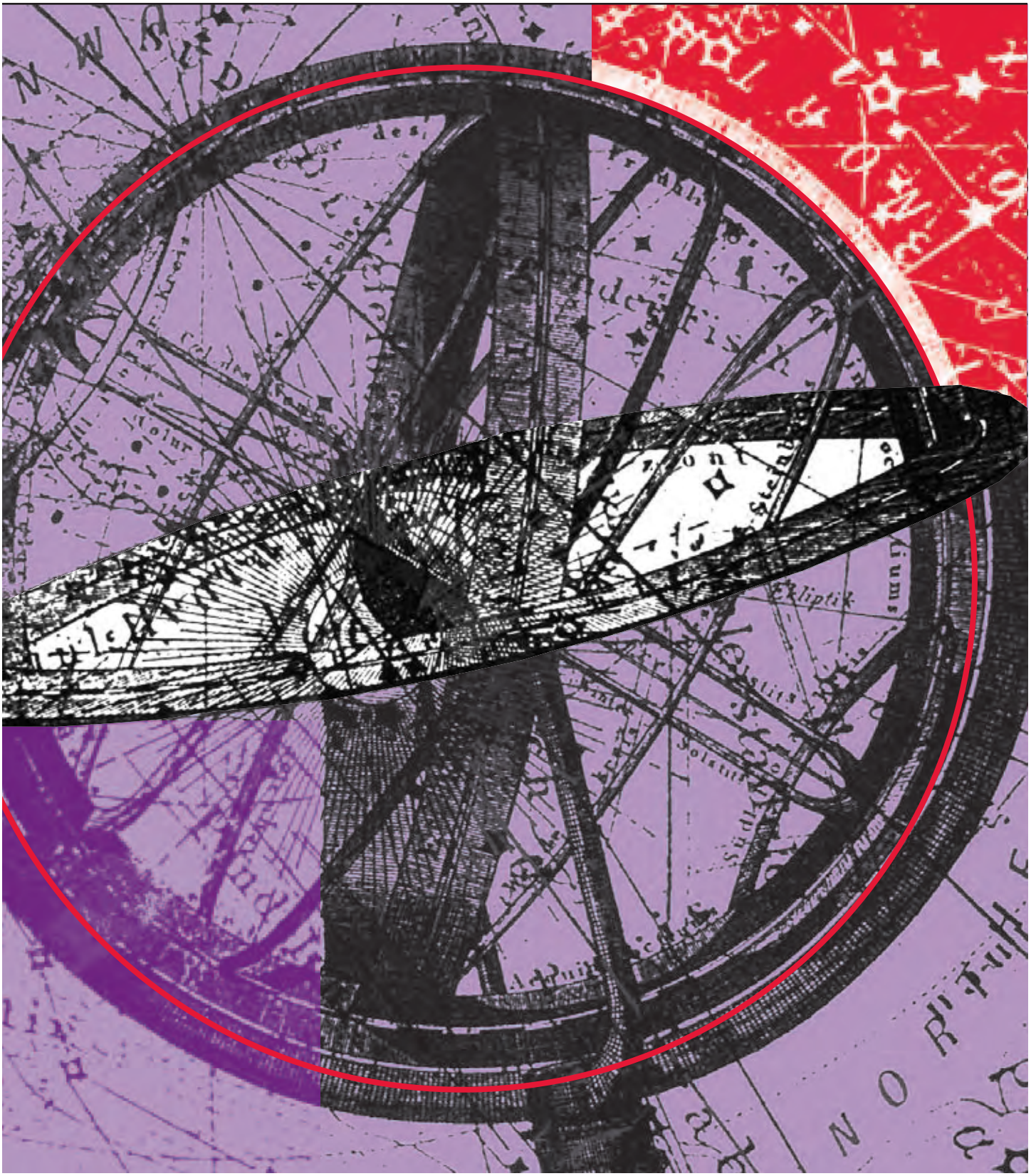

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Balancing Accountability and Staff Development in Urban School Reform

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Students learn best when their teachers are themselves also learning. There is an accumulating body of evidence that supports this commonsense belief. Engaging teachers and administrators in collaborative professional learning focused around mathematics content and pedagogy can improve student achievement (U.S. Department of Education, 1996; Darling-Hammond, 1997; Elmore, 1997). Quality professional development that translates into student achievement must address rigorous mathematical content, how children learn that content, and effective instructional strategies to teach that content (Sparks & Richardson, 1997; Ball & Bass, 2003). Moreover, there is a growing consensus in the field about what constitutes effective professional development (Supovitz, 2001; Loucks-Horsley, Love, Stiles, Mundry, & Hewson, 2003).

At the same time, the national movement for standards-based reform in mathematics (NCTM, 2000), fueled by the Third International Mathematics and Science Study (Stigler & Hiebert, 1999), has increased emphasis on accountability. Although it may appear that there is a contradiction between the accountability movement and intensive staff development, the experiences reported here support the idea that accountability and staff development are intertwined in standards-based reform. Establishing and communicating clear expectations, providing adequate support to help staff meet the expectations, and monitoring the expectations to ensure that they are met, demonstrate commitment to standards-based reform.

In one small urban district, Plainfield, New Jersey, balancing support for staff and accountability (e.g., communicating clear expectations and providing regular feedback) resulted in improved student achievement in mathematics in every elementary school in the district. The purpose of this article is to share some of the tools and techniques used in this district for supporting teacher learning in the context of raising expectations for students, teachers, principals and central office staff. Other district leaders reading about strategies used in Plainfield to implement standards-based elementary mathematics program may gain an image of how such reform might occur in their own situations.

The article is organized chronologically. After describing the district and the initial reform efforts in the background section, the first-year staff development and accountability strategies are described. Then, the staff development and accountability work in Years Two and Three are addressed. A topically oriented chart that summarizes the strategies appears in Appendix A.

Background

Plainfield, located in central New Jersey, enrolls 8500 students in grades PreK-12. Seventy percent of the students qualify for free or reduced lunch and the student population is almost entirely African American or Latino. There are ten elementary schools, two middle schools and one comprehensive high school. Since Plainfield is one of the districts designated for additional aid as part of the Abbott v Burke case in New Jersey, three- and four-year olds are served by full-day, full-year, high-quality preschools, primarily through subcontracts with the community child care centers in the city.

A new administrative team arrived in the district in 1995 to find low student achievement and a culture of low expectations for students and teachers. The vision of the board and the new administration was summarized in a document that was widely circulated and discussed throughout the district. "The 12-Step Framework for Reform in the Plainfield Public Schools," included the following:

1. *Re-thinking of district vision, mission, and beliefs to ensure the success of every child.*
2. *Development of student learning and performance standards that clearly indicate what students should know and be able to do.*
3. *Development of assessment and accountability systems to measure student progress and school/district effectiveness.*
4. *Implementation of policies, procedures, and practices to decentralize decision making to the school site to the maximum extent possible.*
5. *Re-definition of roles, responsibilities, and functions to support and empower staff to make the major decisions affecting the teaching and learning process in the school.*
6. *Utilization of research-driven, data-based approaches to give direction to initiatives to improve teaching and learning processes.*
7. *Expansion of the role of technology in all school district operations (instructional, administrative and management, student data management).*
8. *Establishment of a partnership between union and management to promote and expect shared responsibility for the education of children and the establishment of relationships based upon mutual respect, trust, and accountability.*
9. *Partnerships with parents, community, social and health service agencies, businesses, churches, government at all levels (municipal, county, state, and federal) to ensure comprehensive support for students and their learning needs.*
10. *Improvement of communication strategies and systems to engage all internal and external stakeholder groups in the ongoing work and mission of the public schools of Plainfield.*
11. *Organization and maintenance of systemic efforts to engage parents in the education of their children and the work of the schools and district.*
12. *Establishment of a comprehensive staff development system aimed at the professionalization of teaching and learning in the public schools of Plainfield.*

To begin to put the vision into practice, the Board of Education and the administration negotiated a new contract with the Plainfield Education Association (PEA) that included a joint partnership for school reform. As the preamble to the agreement reads:

> *The parties are committed to developing a collaborative working relationship at all levels of the system. A collaborative relationship is one in which the parties work together with mutual respect, reliability, clear and direct communication and a willingness to understand and consider a different point of view....The Board, The Association, and Administration, at all levels, will act as professional colleagues who sometimes differ about how to solve a problem but who share a common purpose and dedication to the educational achievement of Plainfield students. (Collective Bargaining Agreement, 1995)*

The contract established the Leadership, Innovation, and Change Council (LINCC) to manage reform efforts in the Plainfield Schools. The district LINCC was co-chaired by the superintendent and the association president. Represented on the district council were teachers, the collective bargaining associations for all staff, the parent organization and the high school student organization. School LINCCs were formed to function within parameters established by the Plainfield Board of Education, and federal and state law and regulation. School LINCCs were involved in the following areas of decision-making: staff development, budgeting, accountability, staffing, curricula and instructional materials, disciplinary practices, and others. The district LINCC and the school LINCCs served as forums for debate, venues to hash out concerns and to address "push backs" (resistance) to the reform efforts from staff and parents.

To support school-based decision making, the roles and responsibilities of Plainfield's central office staff were redesigned. If staff were to be empowered at the school level, the district curriculum staff had to play a less directive, more collaborative role. The central office staff partnered with school staff to build capacity for school reform and to facilitate change. There was recognition that change required both a "bottom-up" and a "top-down" strategy at the same time.

For the first few years, the systemic reform efforts in the district did not have an impact on the classrooms. The district and school LINCC members learned about collaboration, staff engaged in conversations around the need for high expectations and efficacy on the part of staff and students, parent and community outreach improved, and staff development increased. However, the activities were too diffuse. There was a growing recognition that all the activity and conversation were not deliberative enough or focused enough to affect teaching and learning.

In order to accomplish the vast changes needed in curriculum and instruction, the district leadership looked to the experience of Community School District #2 in New York City. Research on the reform experiences of Community School District #2 (Elmore & Burney, 1997; Stein & D'Amico, 1998) documents the development and implementation of a standards-based system in the area of language arts literacy. The themes identified by Elmore and Burney (1997) in the District #2 systemic reform efforts that were most applicable to the Plainfield situation included: introduction of instructional changes in one content area at a time; treating staff development as an integral part of system management; balancing central office and site-based decision-making; and hiring external consultants with expertise consistent with the district's strategy.

The reform efforts directly addressing teaching and learning in Plainfield were modeled on the District #2 experience. When the New Jersey State Department of Education required each district school to adopt a whole school reform model as part of the Abbott requirements, nine of the ten elementary schools and both middle schools selected America's Choice, a whole school reform model from the National Center for Education and the Economy that perfectly complemented the district's reform agenda. Plainfield organized a focused, sustained initiative to improve teaching and learning in the area of language arts literacy. As a result of this work over a three-year period, student performance on the New Jersey State fourth grade assessment in language arts literacy significantly improved (Muirhead & Collum, 2004; Supovitz, Poglinco, & Snyder, 2001). The assumption behind this strategy of content-area focus is that, over time, changes in teaching and learning in one content area can reach more content areas and more staff. As teachers are engaging in sustained professional growth and renewal activities, they act as catalysts to cause other teachers to move in new directions. An increased sense of efficacy, experienced by many Plainfield staff members based on the successes in improving teaching and learning in language arts literacy, made the culture of the schools more receptive to addressing the next content area: mathematics.

Building on the approach used in language arts literacy, Plainfield moved in 2001 to implement NSF-developed, standards-based mathematics programs in every classroom. In the elementary schools, the district adopted *Investigations in Number, Data, and Space*; in the middle schools, *Connected Mathematics*; and in the high school, *Interactive Mathematics Program* (IMP). The aim was to bring about district-wide improvement by aligning curriculum and instruction to standards, providing extensive staff development, and monitoring to ensure practice consistent with the standards (Briars & Resnick, 2000). What staff learned from the language arts literacy reform could contribute to more effective and efficient change in mathematics teaching and learning.

From the beginning of the mathematics focus, the district provided intensive and on-going staff development, and designed and communicated clear expectations for teachers, as well as for principals and central office staff. The remainder of this article highlights some of the strategies successfully used over a three-year period as the district implemented the new program, *Investigations in Number, Data, and Space.* The strategies for professional development and accountability during the first year are discussed separately from those in the second and third years to highlight the changes in the balance between accountability and staff development over time. The chart in Appendix A summarizes the accountability and staff development strategies discussed in this article.

Professional Development of Teachers, Coaches and Principals in Year One

In the first year of the new mathematics program, staff commitment and confidence were fragile. Although staff members throughout the district engaged in discussions around the need for standards-based mathematics reform before the move to the new curricula, the comfort level of staff with mathematics as a content area was clearly lower than with language arts literacy. Therefore, the support provided to both classroom teachers and school administrators had to be intensive.

• **Creating the position of mathematics coach.** Mathematics coaches were selected the previous spring from among teachers who were most successful in teaching mathematics and who expressed interest in assuming this role. District supervisory staff and higher education partners from Rutgers University and Kean University began providing support to the group of coaches as soon as they were appointed.

A detailed job description outlined the role of the mathematics coaches. The emphasis during the first year was on providing model lessons in classrooms, helping teachers plan, trouble-shooting related to program implementation, and delivering parent workshops. In order to carry out their responsibilities, the coaches needed to learn about the content and pedagogy of standards-based mathematics, the change process, facilitation skills, and working with adult learners. Along with higher education partners, district supervisory staff and various outside consultants furnished by the National Center for Education and the Economy (the whole school reform model) mentored the coaches on site and met weekly with the coaches. At these weekly meetings, coaches engaged in professional growth activities, collaborated to solve problems that arose, and coordinated the work across the district.

• **Modifying the leadership team.** As part of the whole school reform model adopted by the schools, America's Choice, each school had an existing leadership team consisting of the school administrator(s), a full-time whole school reform coach, a full-time literacy coach, and a parent liaison. To this group, the full-time mathematics coach was added. The school leadership team met weekly to identify needs and solve problems. During the first year of the program implementation, the team focused on addressing nuts-and-bolts issues and creating a mathematically rich environment in each classroom. The leadership team worked to ensure that teachers had the materials required and began to use the rituals and routines of the *Investigations* program. When the leadership team members conducted mathematics focus walks in classrooms, they were careful to select elements of the program to look at that were most neutral in terms of teacher accountability. For example, a focus walk during the first year might look at each classroom to ensure that there was an adequate supply of manipulative materials available. Members were regularly in classrooms, helping teachers and students. In subsequent years, the leadership team took on a stronger accountability role.

The work of the leadership team was supported by both district administrative staff and a cluster leader provided by the National Center for Education and the Economy, the parent agency of the whole school reform model, America's Choice. As principals worked more collaboratively, so did district administrators. A reorganization of the district curriculum and instruction staff ensured that every school had a liaison who attended leadership team meetings regularly and consulted with principals around the work of the team.

• **Providing staff development workshops.** Every elementary teacher in the district was invited to participate in five days of paid staff development in the summer before the program began. The workshops prepared the teachers for the rituals and routines of the Investigations program and engaged them in sample activities from the key instructional modules. TERC, the developers of Investigations, provided workshops for primary and upper elementary teachers. Both district and school administrative staff, and mathematics coaches participated along with the teachers. Over a third of the elementary teachers participated in this initial training. Those who did not attend the summer training, received some initial training from the mathematics coach in the school and/or the district mathematics supervisor, and principals ensured their attendance at monthly workshops discussed below.

All elementary principals and assistant principals, as well as district supervisory staff, attended a three-day summer institute that was focused on mathematics instruction. The emphasis of the sessions was on introducing the administrative staff to the differences between a standards-based program and the traditional textbook-driven, whole-class instruction that they were used to. In addition, about half of the monthly administrative meetings during Year One included professional development related to the mathematics program.

Workshops for teachers across the district were offered regularly during the school day on various topics identified by the leadership teams. Within the schools, weekly grade-level meetings during the school day, led by the mathematics coaches and the principals, focused on nuts-and-bolts issues such as learning the rituals and

routines of the program and creating the appropriate classroom environment for standards-based mathematics. There was some limited review of student work and analysis of children's mathematical thinking and discourse. However, it was not until Year Two that these activities became predominant in teacher meetings.

Accountability Strategies in Year One

At the same time that there was a heavy investment in supporting staff, the district leadership team structured conversations among the stakeholders that laid the basis for a shift to more accountability for classroom instruction in future years. The message from the district administration was clear from the beginning—standards-based mathematics reform in every classroom in every school. However, expressing expectations is only the beginning of an accountability system; documenting how the expectations are being met is key. In Year One, teachers, principals, and district administrators all had opportunities to contribute to crafting the description of what would be monitored and documented beginning in Year Two.

• **Drafting indicators and implementation rubric for standards-based mathematics classrooms.** Early in Year One, a draft was developed that described clearly what a classroom that is implementing standards-based programs should look like. District leaders distributed the draft among the stakeholders and engaged in debate with staff at meetings of leadership teams, site-based management teams, the teacher's union, and school faculty. Based on the feedback from stakeholders, modifications to the indicators were redrafted in the form of a checklist.

When the checklist was finalized, it was widely shared in the spring of Year One. Leadership teams began to informally use the checklist as they visited classrooms during their focus walks. However, leadership teams and administrative staff were careful not to use the checklist in Year One in any way that could be construed as evaluative of teacher performance. In fact, elementary principals were encouraged to do no formal evaluations in the area of mathematics instruction during the first year of the program. However, principals were expected to be in classrooms every day during the mathematics block. Appendix B contains a copy of the final checklist.

Based on the finalized indicators, district leaders developed a draft of a rubric to rate the level of teacher implementation of the program that was also circulated for feedback. This rubric made explicit the expectations of the district leaders for the development of teachers as they learned how to use the new program. Appendix C contains a copy of the rubric.

• **Developing a pacing guide.** During Year One of the program, central office staff provided teachers with a limited number of instructional modules from Investigations to be used and an outline of the order in which they should be used. However, teachers were given a clear message that the first year was for learning the new program and that a clear pacing guide would be developed for Year Two based on their experiences. Therefore, principals and district administrators did not pressure teachers based on their pacing.

• **Revising the target assessment process.** For several years, the district had been administering open-ended assessment items that sampled the standards at each grade level three times during the year. Teachers were provided with summaries of the class data on the target assessment process. The results were reviewed by the teacher and the principal with an eye to improving student outcomes, student by student and class by class. During Year One, the format and content of the target assessments were revised to better align with the new program. Although principals continued to review results on the formative assessments, the emphasis was on using student results on the assessments to support staff learning during the transition to a standards-based mathematics program.

Professional Development of Teachers, Coaches and Principals in Years Two and Three

In Years Two and Three, the support provided for staff continued and intensified. As Elmore (1997) notes, "Setting standards … does not, by itself, address the problem of knowing how to do the right things." (p. 66) In order for teachers to teach differently, professional development must "permeate the work of the organization and the organization of the work." (Elmore & Burney, 1997, p. 15)

• **Developing coaches.** To be an effective mathematics coach, a teacher needs to rethink subject matter and pedagogy. The coaches had limited background in

mathematics so there was a need to deepen content knowledge. In addition, a coach needs excellent interpersonal and facilitation skills (Costa & Garmston, 2002).

Higher education partners provided graduate courses and facilitated study groups designed to address issues of mathematics content. The district expected coaches to enroll in these courses and provided support for other teachers as well to attend. Tuition costs were paid by the district.

The weekly meetings of the coaches complemented the course work by involving the coaches in the regular review of student work, exploration of children's thinking about mathematics, model lessons, role playing, professional reading, collaborative problem solving, and planning for workshops. Between meetings, coaches communicated frequently via e-mail and telephone. The math supervisor regularly visited the schools to assist the coaches.

Each year, coaches attended several days of training that specifically addressed coaching strategies and facilitation. At the weekly meetings, coaches analyzed the inherent dilemmas faced in their role, e.g., how to build collegial relationships of trust, how to avoid being used or viewed as a "spy" for the principal, how to provide feedback without being evaluative.

• **Providing tools in response to identified needs.** Lesson plan templates were drafted and revised to assist teachers in their planning. Teachers were not required to use these templates. Rather, the purpose was to provide a tool that could make the teacher's job easier. In some schools where the climate encouraged collaborative work, teachers developed lesson plans together.

Another tool that proved useful for the teachers was a chart developed by one school leadership team to encourage accountable talk in the classroom. The chart had sentence starters for students to use in explaining their strategies and engaging in collaborative problem solving. This chart was shared among the schools and was posted in many classrooms.

Other tools developed in response to needs identified by teachers, principals, and parents included: observational checklists for specific components of the program (e.g., accountable talk); a question-and-answer letter to help explain the new program to parents (provided in both English and Spanish); child-friendly rubrics for the primary grades; parent booklets summarizing what all students should know and be able to do at the end of each school year in mathematics; a portfolio format and forms for student and teacher feedback on the work selected for the portfolios; and standards-based report cards for communicating student progress.

• **Providing staff development workshops.** In the summers before Year Two and Year Three, teachers were again invited to attend paid summer training in the program. New teachers were provided with the Year One training.

There continued to be half-day workshops offered for every elementary grade level to specifically address mathematical pedagogy and content needed to implement the program. However, increasingly, workshops were provided at the school level by the coaches in response to specific identified needs of teachers or of students. Strategies for professional growth other than workshops became more common such as: observing in other classrooms for a particular purpose (e.g., to see how a teacher used effective questioning skills); study groups; review of student work; review of data; and common planning). Resources such as *Bridges to Classroom Mathematics*, a standards-based training program developed by TERC and the Consortium for Mathematics and its Applications (COMAP, 2003), provided coaches with workshop agendas, videotapes, and student work on a variety of mathematical content. On average, each elementary teacher of mathematics participated in 45 hours of staff development workshops related to mathematics during Year Two and 35 hours during Year Three.

Staff development for principals intensified in Years Two and Three. In the summer institute for administrators, clinical assignments involved the participants in observing in summer school classrooms where the new program was being used and in interviewing students about their mathematical thinking. During the monthly administrative meetings, discussion focused on the supervision of mathematics instruction. Principals watched videotapes of classroom instruction

in elementary mathematics and discussed how to provide feedback to teachers based on their observation. Reviewing student work in mathematics and analyzing results on various assessments in mathematics helped the school administrators learn how to observe standards-based mathematics classrooms. Where possible, these administrative meetings were held at different elementary schools to provide opportunities for discussion of student work in classroom math folders and posted in classrooms and halls. Each elementary school administrator engaged in at least 30 hours of professional development in elementary mathematics during each of the two years.

At the end of Year Three, higher education partners provided Lenses on Learning training for the district administrators (Grant, et al., 2003). The combination of videotaped lessons, professional reading, and discussion about student thinking helped participants think about the need to have a deep understanding of the content in order to observe teachers and provide useful feedback to them. As one principal commented during the session on June 10, 2004, "*Supervisors have to get teachers to think about their practice. Don't just go into the classroom for a snapshot. You have to determine what kids are understanding. … What was the teacher's intent? What was driving the teacher's thinking? This is what you could discuss with the teacher.*"

• **Growing other professional development initiatives.** Leadership teams in each of the ten schools carried out various other professional development activities. One school had a study group where the entire school read a professional article or book related to mathematics instruction and discussed the assigned reading in small groups at a regular staff meeting. Another school used the staff meeting time to engage teachers in a walk-through of all the classrooms in their own school to encourage idea sharing. In addition, inter-class and inter-school visitations supported learning from each other.

With the support of faculty from Rutgers University, lesson study groups (Lewis, 2002) were organized and approximately 20 elementary teachers and mathematics coaches participated. The teachers were grouped by grade cluster and each group addressed an area of focus in mathematics with a research lesson. They observed each other teaching the lesson and worked to improve the lesson based on the feedback.

Accountability Strategies in Years Two and Three

At the beginning of Year Two, the superintendent sent a letter to every elementary school staff member conveying the clear expectations for the implementation of the mathematics program. In his message, he announced the beginning of the walk-through process for mathematics as follows:

> *At the end of this month, we are beginning our walk-throughs. This year, the first walk-through will focus on the implementation of the new mathematics program. The rubric that has been shared with your school indicates the developmental continuum that teachers follow as they learn to use the Investigations program.*
>
> • *I do not expect to see classrooms that are fully implementing and integrating the program at this time.*
>
> • *I do expect, however, to see all classrooms at least scoring at the beginning level on the rubric.*
>
> • *I do expect to see a classroom environment that reflects the Investigations program.*
>
> • *I do expect to see every teacher putting in the effort needed to help students achieve standards in mathematics.*
>
> • *I do expect to see that teachers are trying to engage students in accountable talk around mathematical ideas. (Letter dated September 23, 2002)*

This clear communication of the expectations for Year Two conveyed a shift from mostly supporting staff in the first year to providing more pressure on classroom teachers and principals. However, the purpose of the walk-through process was improving teaching and learning and therefore required support mechanisms. The superintendent ended his letter with a commitment to the development of staff:

> *The purpose of the feedback is to use it to improve. We want the Plainfield Public Schools to be a place where continuous learning is the norm — for students, for teachers, for administrators, for parents, and for the superintendent. I look forward to learning with you how to implement the rigorous new standards that our students must reach to be successful. (Letter dated September 23, 2002)*

• **Conducting district walk-throughs.** In the fall and the spring of Year Two, and the fall of Year Three, every

elementary classroom was visited by at least two observers, one from the district administration and one from the school leadership team. The two raters observed a math block in each classroom and reached consensus in completing the checklist and assigning a rubric score on the level of implementation (see Appendices B and C). Observers held a brief conference with each teacher after the visit and shared the completed checklist and rubric score to provide non-judgmental feedback. In addition, after all the teachers were visited, the walk-through team met with the leadership team to identify school-wide areas for growth.

The purpose of the walk-throughs was not evaluative, and principals were cautioned not to use data collected as part of teacher evaluation. However, the data were to be used to identify areas of need. Data from the walk-throughs determined workshop topics offered by the district and school as well as the nature of classroom assistance provided by the mathematics coach and principal at the school.

As indicated by the superintendent's message, the focus of the first walk-through was on the nuts and bolts of the program implementation. In order to score at the "Beginning" level on the rubric, a teacher would need to have established a classroom environment with all required materials and elements, a one-hour mathematics block, and the program routines and procedures (see Appendix C).

In subsequent walk-throughs, the expectations for the teachers were higher. Visitors observed how teachers encouraged collaboration and reflection among the students. How did teachers document individual student concept development and provide feedback to students about their thinking? How did teachers use data in instructional decision making? Were students reflecting on their own work and building on the thinking of others? Could students engage in accountable talk, that is, talk about their mathematical ideas and strategies? How did portfolios of student work demonstrate progress towards meeting the standards? Most importantly, teachers were expected to be more able to act as facilitators of students' mathematical learning.

• **Monitoring program pacing.** The new pacing guide was used by the leadership teams to monitor the pacing of program implementation. A range of dates was given to indicate when a module should be finished and the module assessment completed. The leadership team, as well as teachers during the weekly grade-level meetings, reviewed the results of the module assessments to identify areas of need. Feedback from teachers resulted in modifications to the pacing guide, as needed.

• **Conferencing around results on the target assessment process.** In many schools, principals met several times a year with each teacher or with each grade level team to discuss student results on the target assessments. The conversations focused on strengths and needs of the class and individual students, strategies for improvement, and support that the teacher might need to carry out the improvement strategies. These results-oriented conferences sent a strong message that the principal expected all students to reach the standards and also that the principal recognized his or her responsibility in making that happen.

• **Growing school-based accountability.** School leadership teams were encouraged to develop their own accountability strategies. The district accountability system required each school to present an end-of-the-year report to the community. In one school, where the level of trust was high, the end-of-the-year report included data on implementation of the program and student achievement by classroom. In another school, the leadership team organized parent walk-throughs using the same indicators as a mechanism for parents to better understand the mathematics program. Many schools developed strategies for documenting and celebrating student learning. In most schools, the leadership team decided to reorganize classes in grades 3-5 so that teachers specialized; teachers who were stronger in mathematics taught more of the students in that subject area. The growth of school-based responsibility for student learning is part of becoming a learning community.

Conclusions

By Year Three, after years of flat, poor performance in mathematics on the state's fourth grade assessment, 54.4% of the students met the proficiency level in mathematics, an increase of 19 percentage points from spring 2003 to spring 2004. In the following year, there was a further increase of 6 percentage points. For the first time, the district had more than 10% of the students scoring at advanced proficient, a considerable increase. Moreover, the data from the walk-throughs indicated that almost 45% of

the teachers were rated at the high end of the rubric, as "implementing" or "integrating" (see Appendix C). The teachers with higher ratings on the rubric also had a higher percentage of students passing the state test and scoring at advanced proficient. These results provide evidence that a well implemented, standards-based mathematics program can have significant influence on student achievement on the high-stakes state tests.

The goal was to implement the program consistently in every classroom in every school through balancing the pressure teachers feel from increased expectations and accountability with support strategies to encourage teacher efficacy. Just as teachers become more engaged as they perceive themselves to be more successful, so do students work harder when they can see that they are learning. As Elmore (2004) notes, "The teacher's sense of efficacy comes from the observed effects of her work with the student." (p. 285) Just as the teacher in a standards-based classroom is explicit about what students need to achieve in order to reach the standard, so was the district administration clear about the expectations for teachers. Just as teachers must support student learning if every student is to reach the standard, so must district leaders support teacher learning. Accountability and professional development are intertwined.

Over the three years of program implementation activities outlined in this article, emphasis shifted between accountability and professional development, pressure and support. Some of the shifts were planned; others occurred in response to feedback from stakeholders. The experiences in Plainfield demonstrate that a district-wide initiative to improve mathematics achievement through standards-based reform can work. However, the story also shows the importance of involving stakeholders from the beginning in decision making. What works in one context is not directly transferable to another. The groundwork done in the first few years of the district's efforts, before the specific focus on content area reform, began the change in culture that occurred in Plainfield. This culture shift made it possible to make improvements in teaching and learning. The willingness of the district leadership to engage in debate with teachers, with parents, with principals, and with students, while at the same time, maintaining a commitment to standards-based reform and improved student outcomes, resulted in progress.

The specific strategies for accountability and professional development that worked for the Plainfield community may not work in other contexts. However, if a district leadership is committed to developing a learning community where administrators, teachers, parents and students are learning at the same time, the specific strategies that will be effective will emerge from collaborative inquiry. The district's mission quoted below includes the phrase, "whatever it takes." What it takes to reform a district is to build a community of learners with a shared commitment to the mission:

> *The Plainfield Public Schools, in partnership with its community, shall do whatever it takes for every student to achieve high academic standards. No alibis. No excuses. No exceptions.*

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APPENDIX A
Summary of Accountability and Professional Development Strategies

Accountability Strategies	Professional Development Strategies
Communicating high expectations • Collaborative development of standards-based indicators and rubrics for implementation of the mathematics program • Pacing guide to communicate expectations for program implementation	**Providing external experts consistent with the program** • Workshops and coaching from consultants from America's Choice, the whole school reform model adopted by the schools • Workshops and coaching from higher education partners • Workshops from TERC trainers on *Investigations in Number, Data and Space*
Establishing school-based leadership • Creation of School Leadership, Innovation and Change Council (site-based management team) • Creation of the school leadership teams	**Developing mathematics coaches and school-based leadership team members** • Staff development workshops and graduate courses about mathematics content, how children learn, and pedagogy • Weekly meetings of coaches with district supervisors for problem solving • Learning how to facilitate and coach • Understanding the change process • Lesson study • Study groups • Coaching from district supervisors and higher education partners
Developing and administering a target assessment process • Collection of data on progress towards the standards at three points during the school year to use in instructional decision making at the school and district levels • Conferences between teachers and principals about the results	**Providing district-wide and school-based professional growth opportunities for teachers in response to identified needs** • Half-day workshops by grade level for teachers across the district on content and pedagogy • Use of weekly grade-level meetings in the schools for professional development activities • Observing in other classrooms and working with coach in own classroom
Monitoring program implementation • Focus walks by leadership team members in schools • Monitoring program pacing and reviewing results on module assessments by leadership team members • Principals visit classrooms every day during the mathematics block • District walk-throughs using the implementation indicators and rubric	**Providing staff development for principals and supervisors** • Summer institutes for principals including clinical experiences with summer school students and teachers • Math-focused staff development at monthly administrative meetings, including review of student work, viewing videotapes of lessons, exploring teacher evaluation strategies for standards-based mathematics • Coaching from district staff • *Lenses on Learning* training
Encouraging school-based accountability strategies • Disaggregated data by classroom made public in the school • Parent walk-throughs to learn about the program • Celebrating and documenting student learning • Teacher specialization in the upper elementary grades based on data analysis	**Developing customized tools in response to identified needs** • Templates for lesson planning • Templates for summary of classroom data • Observational checklists for specific program components (e.g., accountable talk) • Booklets for parents with grade-level expectations in English and Spanish • Q&A document in two languages to explain Investigations to parents • Portfolio formats and forms for student and teacher feedback on work selected • Standards-based report cards for communicating student progress

APPENDIX B
Standards-Based Mathematics Instruction Checklist

Teacher: _____

School: _____

Date: _____ Time: _____

N = not evident; **P** = in progress; **E** = evident; **NA** = not applicable

N	P	E	NA	
☐	☐	☐	☐	**Designated area for math materials and artifacts (e.g., word wall) and sufficient supply of materials available for use.**
☐	☐	☐	☐	**Procedures, routines/instructions displayed and students demonstrate knowledge of them.**
☐	☐	☐	☐	**Lesson plans reflecting one hour Investigations block, 10-minute math, and standards-based homework.**
☐	☐	☐	☐	**Student work with teacher commentary/feedback displayed on a standards-based bulletin board.**
☐	☐	☐	☐	**Math notebooks/journals/work folders that should include: Investigations activity sheets, standards-based homework, student problem solutions that include pictures, numbers and words, teacher feedback that is standards based.**
☐	☐	☐	☐	**Evidence of all components of Investigations lesson—introduction, exploration and summary.**

Notes:

☐ ☐ ☐ ☐ **Evidence of regular assessment and documentation of student progress**

1. anecdotal notes kept on each student
2. standards-based commentary/feedback evident on student work
3. portfolios for every student
4. student reflections evident on student-selected work in portfolio
5. end of unit assessments administered, scored and documented

Notes:

☐ ☐ ☐ ☐ **Evidence of cooperative learning group dynamics**

1. students working in a variety of groupings
2. students sharing materials
3. students noting and building on the work of others
4. students considering their own reasoning and respecting that of others

Notes:

N	P	E	NA	
☐	☐	☐	☐	**Evidence of student discourse**

1. accountable talk
2. students describing their work
3. students using standard math terms
4. students creating their own descriptive words

Notes:

☐	☐	☐	☐	**Teacher as facilitator**

1. supports an environment of inquiry (asks good questions — "say why", observes and orchestrates oral and written discourse)
2. gives students the tools to construct meaning in their encounters with academic and social tasks in an ever-changing world
3. encourages students to be responsible for their learning and their behavior
4. helps all students to make connections among key areas in mathematics and the real world

Notes:

GENERAL NOTES

Student is able to respond to questions posed.

E.g., What do you do during math? How do you know what to do? How does your teacher help you?

Summary feedback

Implementation Level on Rubric _____

Please note: This feedback is given for the sole purpose of supporting continuous growth and improvement.

Visitors: _____

APPENDIX C
Implementation Rubric

PRE-IMPLEMENTING	RESPONSE TYPE 1	EVOLVING	IMPLEMENTING	INTEGRATING
Teacher has: • attended Investigations training • determined routines and procedures necessary to support Investigations • established a place in classroom for math materials • all teacher materials available • established an area for standards-based student work (e.g. bulletin board) Teacher has: • attended Investigations training • determined routines and procedures necessary to support Investigations • established a place in classroom for math materials • all teacher materials available • established an area for standards-based student work (e.g. bulletin board)	Teacher has demonstrated all traits for pre-implementing and has: • prepared the classroom environment for Investigations • established a 1-hr. math block • assessed whether the class has internalized the routines and procedures of the math block • incorporated some of the elements of the investigations lesson into the math block	Teacher has demonstrated all traits for beginning and has: • included 10 minute math in lesson plans • established a system for recording anecdotal notes • used end of unit checklists to create class profiles • maintained established routines and procedures • established an environment of inquiry (e.g. why, how do you know....) • begun to assume the role of facilitator, modeling accountable talk • begun to use standards and rubrics to review student work • actively and continuously participated in building-based math articulation • made all components of lesson (introduction, exploration, summary) part of daily routine	Teacher has demonstrated all traits for evolving and has: • effectively incorporated all components of lesson as part of daily routine • included daily 10-minute math in plans and instruction • regularly documented anecdotal notes for each student • incorporated standards-based feedback on student work • demonstrated effective classroom management (e.g. students know and use routines and rituals for the math block) • used observations of student work during explorations to guide summaries • established a clear expectation for student accountable talk (e.g. student accountable talk is evident in the classroom)	Teacher has demonstrated all traits for implementing and has: • integrated Investigations as a natural part of classroom instruction • exhibited skill and confidence in implementing all aspects of Investigations sessions • established a learning environment where student accountable talk is the norm • selects appropriate work to be shared during summary, showing a variety of strategies and representations • posted student work with standards-based commentary/ feedback • established student portfolios • uses standards-based feedback regularly to focus and support the mathematical development of all students