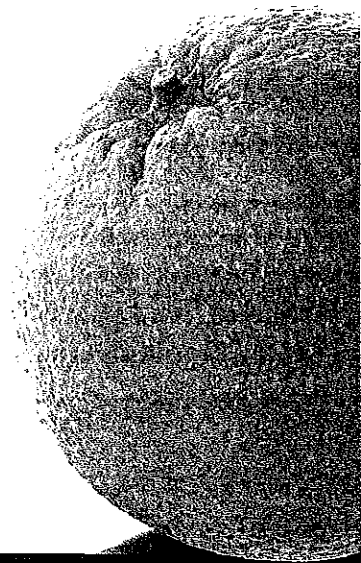
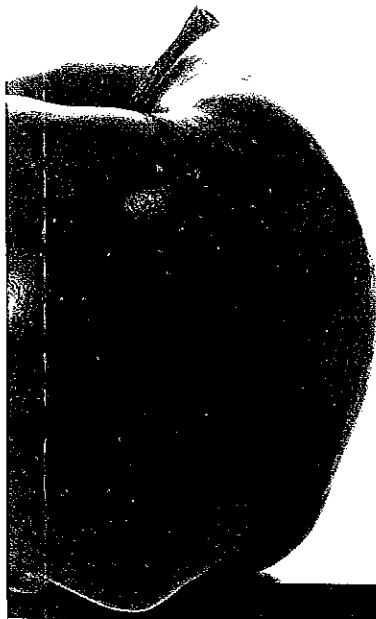


ALAN M. BLANKSTEIN • PEDRO NOGUERA
with Lorena Kelly

Foreword by Archbishop Desmond Tutu

EXCELLENCE THROUGH EQUITY

Five Principles of
Courageous Leadership
to Guide Achievement
for Every Student



Equity and Achievement in the Elementary School

12

*How We Redesigned Our
Math Instruction to Increase
Achievement for Every Child*

Darlene Berg

I recently attended a meeting of elementary school math educators, who came together to discuss classroom instruction. The morning's speaker was hoping for a responsive and engaged audience. For an ice-breaker, letter-size paper and markers were placed on the tabletops. Each audience member was asked to use a sheet of paper to construct a simple tent and to write their name in the center of one side. Additionally, we were asked to think of numbers or symbols that would in some way identify our own district's experiences relative to the teaching of math in our elementary schools. We had to place one symbol or number in each of the four corners of the paper name tent, and as we took turns to introduce ourselves, we were asked to explain our choices.

Without hesitation, I wrote one of each number in a corner around my name: 3,400, 7, 4, 87%. When it was my turn to share, I explained, "Each day the teachers and administrators that I work with are responsible for changing the lives of 3,400 children. We are a culturally and economically diverse district with seven elementary schools. We are approaching our fourth year of the full implementation of the revision of

our math program in Grades K through 5, and on the recent Common Core State Standards testing, our students in Grades 3 through 5 demonstrated, on average, 87% math proficiency, up from 74% in 2009." I could have continued, but they said to be brief!

Some of the more interesting data about our district's math instruction is in the details that I didn't have the opportunity to share that day. I work as the elementary-math supervisor in the West Orange, New Jersey, school district. In this focused area of the curriculum, we have begun to significantly close our economic and cultural achievement gaps, and we have done so not at the expense of the economically advantaged. We did not lower our standards, and as a result, even our previously successful students are demonstrating greater success. Not only have we reduced the percentage of children who are nonproficient in math, but we have also shifted large numbers of children up the continuum into the area of advanced proficiency performance. Some of our individual schools' scores rival those of the less economically disparate communities close to us, which have elementary schools with nearly 0% economically disadvantaged student populations. We also know that we are at the beginning of this process, and while the data does show significant and good things are happening here, we still have a way to go, and more improvement is needed.

West Orange is located about 15 miles from New York City as the crow flies, in the most densely populated state in the United States. Our town has been described as a miniature version of Manhattan because of the economic and cultural diversity of the community. Physically and symbolically, our town lies between two mountains. Our residents include the rich and famous as well as recently arrived immigrants of modest means. Our district has identified more than 50 unique languages being spoken in the homes of our students, in addition to English. It is a vibrant town, and as a school community it presents challenges and opportunities.

As a school district, one way that we are able to analyze our elementary students' math proficiency is through reports that are generated from the administration of the annual state exams: the New Jersey Assessment of Skills and Knowledge (NJASK) in Grades 3 through 5. These data help us to see how we are doing academically for math, language arts literacy, and Grade 4 science. This information also describes who we are, demographically speaking.

Using the defined subgroups taken from the No Child Left Behind Act of 2001 according to the most recent data, our district's Grades 3 through 5 population is 33% economically disadvantaged. Culturally, we are 39% African American/Black, 26% Hispanic, and 25% White. About 7% of our student population is Asian, and 3% of our students combined are

identified in the subgroups of American Indian, Pacific Islander, or two or more races. While testing data don't tell us everything we need to know about student success or the lack of success, this information provides a basis for conversations and opportunities to identify trends and to inform decision making. All of these data are publicly available through the New Jersey Department of Education website (New Jersey Department of Education, 2013). As you can see in Table 12.1 and Figure 12.1, within these data we have begun to see the academic improvements for all of our students by grade level, comparing cohorts from 4 years ago to cohorts in the latest testing cycle. To demonstrate the progress we've made as a district, I've chosen to compare our levels of proficiency for our three largest identifiable subgroups and the economically disadvantaged. I've included the noneconomically disadvantaged to show that they too have demonstrated significant improvement.

The school year 2008 to 2009 was the year before we began piloting new curriculum resources embedded with the identifiable instructional practices that have been at the core of our success. The school year 2013 provides our most current data (see Table 12.1 and Figure 12.1).

As a math supervisor, I work with and support an instructional team of seven elementary school principals and more than 150 teachers who interact daily with our 3,400 elementary school students. Together with our district administrators, our job is to improve the academic performance of each child as we prepare our students for 21st century citizenship. More than 5 years ago, we embarked on a rigorous course to improve how we were teaching mathematics in our seven elementary schools, because having one out of every four students fail math on the state exams was not a result we were willing to live with. The process was challenging and involved a lot of information, cooperation, energy, and hard work. It seems to be working. We see our success in a number of ways. We analyze the student performance data for the testing of Grades 3, 4, and 5 through the annual School Performance Reports (New Jersey Department of Education, 2013) issued by our State Department of Education. The columns of disaggregated data show significant increases in proficiency by cultural and economic subgroups. The data are useful, and standardized testing provides some insight as to what is occurring, but we also know that we are successful by the level of academic conversations we hear our students having in their math classes. We know that things are moving in the right direction because, when asked, many of our students identify math as their favorite subject. Our hard working teachers discuss the significant shifts in student learning as a result of the instructional strategies that they use in teaching math, and they are happier with the math instruction that they are delivering because of the success that their

Table 12.1 Comparison of Percentage of Proficiency by Demographic Group in 2009 and 2013*

	Total All Groups	Whites	Blacks	Hispanics	Economically Disadvantaged	Noneconomically Disadvantaged
Grade 3						
2009 District	74.0%	90.0%	68.0%	62.4%	58.8%	80.8%
2013 District**	84.0%	93.4%	81.0%	74.5%	75.1%	88.5%
Grade 4						
2009 District	67.8%	83.3%	60.6%	58.5%	57.1%	73.5%
2013 District**	87.1%	93.0%	83.2%	83.1%	80.4%	90.4%
Grade 5						
2009 District	79.2%	93.9%	74.5%	70.4%	65.4%	85.2%
2013 District**	88.7%	94.3%	84.3%	86.8%	82.2%	91.9%

* Data included on the NJ DOE School Report Card 2009, NJ DOB School Performance Report 2013, New Jersey Department of Education.

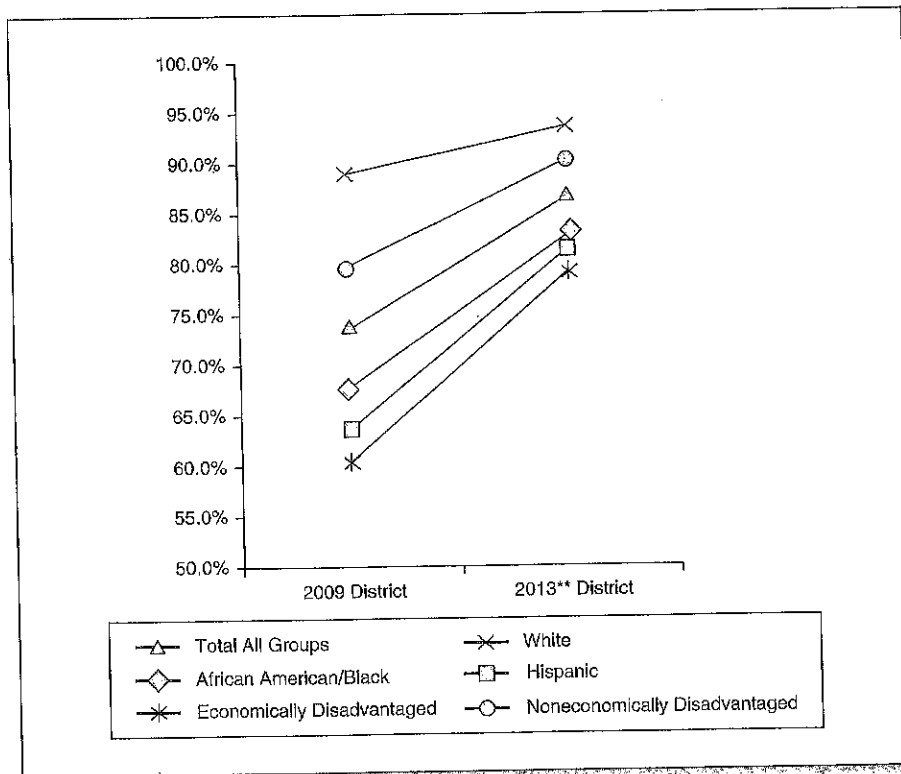
** First year of implementation of the new Common Core State Standards for Mathematics.

students are demonstrating. Parents share insights about their children who are finding success in math. I began to realize that something really significant was happening, too, when I no longer heard conversations that began with "My students can't because . . ."

In our elementary-math classrooms, we are closing the achievement gap that has existed for some of our students. We did this by recognizing that the most important resource that we had to guarantee student outcomes was the teacher in the room. We had to look at what was not working for the teachers, what challenges the teachers were facing, and then support the teachers to overcome those challenges. We all had a common vision: we all wanted all of our students to be successful learners. Making that happen equitably in all of our classrooms was the mission.

Early in my career in West Orange as the district math coach, my responsibilities included providing teachers with support to improve student learning through increased use of research-based instructional

Figure 12.1 Increase in Proficiency Rates in Grades 3, 4, and 5*



* Data included on the NJ DOE School Report Card 2009, NJ DOE School Performance Report 2013, New Jersey Department of Education.

** First year of implementation of the new Common Core State Standards for Mathematics.

strategies. I visited classrooms and worked with the teachers by modeling math lessons using a variety of resources and differentiation strategies to connect with the varied learning styles and needs of the students. Most of the teachers were very receptive to the teacher/coaching model, and they saw that the students' level of engagement was high. During these lessons, one of the most significant ways to reach students who had difficulties grasping math concepts was to introduce the use of manipulatives to support the progression of understanding by helping them to make concrete-iconic-symbolic connections (Bruner, 1976). Examples of the types of resources that incorporated multiple representations of math concepts were the lessons from the *Illuminations* series provided by the National Council of Teachers of Mathematics (NCTM, 2014) and also the lessons found at Marilyn Burns's Math Solutions (Mathsolutions.com). These resources were effective in demonstrating to teachers how

to support students' explorations of math concepts such as what pi represents by measuring around soda cans with pieces of string (Burns, 2014) or comparing and contrasting properties of shapes and angles by using origami or drinking straws to create geometric models (NCTM, 2014). These websites also provided ideas to incorporate math games to help students to develop procedural fluency by practicing operations with whole numbers, fractions, and decimals.

We helped students to build on their conceptual knowledge, too, by developing their skills with reasoning and communicating. We had them write out their work onto transparencies that were then placed on overhead projectors. With their work displayed for the class, students would demonstrate and discuss how they solved a problem while their classmates asked questions or critiqued their work. To further our own understanding on how to close some of the experiential gaps that prevented students from seeing math connections in real life, the teachers and I would use in-district workshops to investigate the use of children's literature during the math lesson (Burns, 2014).

Through these classroom visits and workshops, I got to know most of the teachers, and I recognized that we did have a very caring, hardworking staff, but progress was slow. Many of the ideas and lessons that were presented worked their way into lesson plans throughout the district, but it was neither consistent nor systemic. Many teachers were still uncomfortable with making dramatic adjustments to their own familiar instructional practices. This was understandable and especially true in the testing grades, where for some teachers, the fear of potentially lowering test scores by making dramatic shifts in instruction was a paralyzing impediment to change. Through several years of coteaching experiences, it became clear that while teachers saw the value of the instructional strategies that were demonstrated and discussed, they did not see how these fit into their math lessons on a daily basis for the entire school year. Additionally, many conversations focused on the concern that some students faced challenges outside of the classroom that some teachers felt we could not overcome in the classroom, and the thinking was that somehow, by deviating from traditional teacher-centered instruction, we might make it harder for struggling students to learn. During these discussions with my teachers, I agreed that inequitable life experiences did impact how some students processed learning, but I also believed that the experiences we presented in the learning process should be varied enough to overcome the disparities and bring all students to the table. One way to do this was to learn how to incorporate effective instructional strategies equitably for all of our math lessons in all of our classrooms.

What was needed to make this the new norm was a yearlong curriculum of research-based materials that consistently guided the teachers at

the point of instruction in math content and rigor and also gave them options for scaffolding or extending the learning based on what the students needed, when the students needed it. And it was not going to be enough to just hand over resources to the teachers; we had to have a clear plan for the sustained professional development needs from the start. This placed a greater responsibility on finding the right resources to support the district's guidelines for instructional strategies and then implementing those resources correctly. As one teacher told me, "We will do what is best for our students, but please make certain that they (central office) know we need time to make this work and we need training."

Eventually, we looked to a revision of our math teaching resources as a means to support a foundation upon which to make the instructional shifts in math education to promote success for all of our students. Our approach to equity was to provide a solid framework so that every teacher could implement the instructional strategies that would support the diversity of learning among our students. Over the next paragraphs, I will recount the process as it evolved for us.

When the district had to consider purchasing new math resources for the elementary schools, we were fortunate to have a committee of teachers who brought a tremendous level of professionalism and insight to the process. Collaboratively, they reviewed resources and analyzed sample lessons. They identified what support was embedded in the materials that would help teachers to make decisions to use research-based instructional practices in the daily math lessons. A group of teachers wanted to find a successful school district similar to ours in demographics and see what its teachers were doing in their classrooms. That was a great idea! We set about looking for a district as large as we were, with similar social and economic demographics and whose students were successful. We looked up scores. How were the neighbors doing? When we located a district that agreed to host us, we took a group of teachers out to see them, to sit in their classrooms and watch them teach. Our teachers talked to their teachers about what was working and to their students about what they liked about learning math. They asked what challenges the faculty faced as they made the shift in instructional practices. The group brought that information back to the district, and it became part of the conversation about change.

I remember thinking that throughout the entire process of redefining our classroom instruction and choosing the support materials that were going to help us do it, as a teaching community, we were working toward developing a common understanding of what equitable instruction looked like, and we were identifying opportunities to support and maintain what the professionals in the room had to do. The process sometimes

included debates and sometimes heated discussions, but ultimately the teachers saw for themselves how they could effect positive change for all of our students.

Eventually, two series were chosen and piloted in several of the schools, in the testing grades. Surveys were conducted among the teachers asking what worked and what didn't work, and then ultimately a final choice was made. Then the real work began.

We understood that the process we had undertaken was not so much about which resources we were purchasing as it was about creating a consistent, systemic application of instructional strategies that would increase opportunities for all of our students to be successful in learning math. The materials had to support this goal. Professional development had to support the teachers in the application of the process.

The first year, we delivered the resources to the teachers during the summer months prior to the start of the new school year. Just before classes began in September, full day workshops were held by grade level, to talk about lesson structure and share tips on "how to." We made certain that the workshop presenters were teachers or former teachers who had used the resources and understood the instructional practices that we were asking our teachers to use. They could relate anecdotally about what worked in classrooms with diverse student needs. We had teachers critique the presenters so that we understood who had been most helpful to them and why. We paid attention to what the teachers told us, and we used their feedback to design each next level of training. Principals attended the trainings with their teachers so that they could understand the overarching ideas, the instructional strategies, and provide the moral support. They became an additional resource to the teachers to solve problems and answer questions and concerns.

During this time, anxiety was high. We listened to the teachers' concerns. They were worried that they would not have everything that they needed. The district made certain that they had the classroom resources that they needed to achieve the practices that they were being asked to do; manipulatives, charts, graphic organizers, classroom sets of slates and markers, materials for academic games, and student practice books.

Teachers were asked to walk a narrow corridor and to implement the design and structure of the lessons with fidelity. Some teachers felt that this approach curbed their creativity. The district offered a solution. If teachers could maintain fidelity to the lesson structure we presented, we would build in a "Flexible Friday" that each individual teacher could use in any number of ways based on the instructional needs of their students. Friday's math lesson could be devoted to centers, to extension activities, to projects. This became a popular component of instruction and is still used

in all of our schools. Teachers were worried that the training was not going to be enough. The professional development continued that first year and each year since. The most useful workshop presenters were brought back. Teachers were guided in the use of effective grouping techniques for students: heterogeneous pairs, homogeneous pairs, small-group activities, and whole-class instruction. Teachers were shown how to implement formative assessment in the daily lesson to help them to make adjustments to their teaching based on realizing where their students were in their learning. Teachers were shown how the structure of the lessons encouraged learning dynamics in children who previously had been totally passive in the math classroom. Teachers became proficient in using a gradual release of responsibility model of instruction (Pearson & Gallagher, 1983), rather than a traditional teacher-centered approach. Once these instructional strategies were happening consistently and systematically in every building, positive results started to show.

One of the best comments that we received from the teacher feedback following our first workshops was a request to provide differentiated workshops to the teachers. Among the teaching staff were varied levels of expertise and confidence, and the suggestion that our training for the faculty should reflect our understanding of differentiated instruction was right on the money. That first year, as we approached our 100th day of school, we sent out an electronic teacher needs survey. We asked teachers to identify the areas they most wanted additional help with, choosing from five categories: demonstrating an upcoming lesson, demonstrating technology support, pacing the lessons, incorporating differentiation, and other. The responses were collected and organized by building and then by grade level within the building. Specific trends in the needs analysis started to appear. It was decided that in order to make the professional development as supportive as possible, we would send a workshop presenter to each building for the day. We gave each presenter, in advance, the results by grade level of what the teachers felt they needed the most help with. The principals supported this by arranging for a workspace and organizing the schedules so that each grade-level team of teachers could meet with the trainers as a small group. I attended many of the training sessions, and each one started with these questions: "What three things are working? What three things are not working?" The groups celebrated the things that were working, and interestingly, most of the responses to this question started with "The students are really enjoying math!" The items that were not working were discussed, and suggested solutions were shared.

Building-based professional development has been one of the best received ideas. In their small groups, teachers focus on the math instructional needs specific to their population of students. The atmosphere is

relaxed, professional, supportive, and productive. Students don't have to lose a full day of instruction so that their teachers can attend the workshop; the workshop comes to the teachers. Principals have been very receptive, and only a few substitutes need to be brought into the building for the day, as we rotate them through the grade levels so that small groups of teachers can move through the training throughout the day.

Each successive year has included training opportunities for teachers new to the district's elementary-math classrooms, as well as opportunities to continue the training for teachers experienced in the math program. Special education and basic skills teachers are included in trainings with the general education teachers so that a consistency of expectations is achieved. The instructional route map has been established, and all of our teachers are better able to make informed decisions about the learning needs of each student.

One of the obstacles we had faced for years was how some classrooms seemed to be individual silos of learning. As we began to develop a common language of instruction, opportunities for teachers to meet as a grade level to work together increased. Where we see some of the largest percentages of student success are in those grade levels in which the teachers meet regularly, plan together, help each other to solve instructional problems, and share ideas. One of my teachers described how she uses her experiences as a member of a professional collaborative group as an example for her students in how to work together collaboratively to problem solve.

Meeting the needs of our diverse student population by providing diverse instruction has helped us to increase the levels of math proficiency for our students. Traditional modes of instruction are not equitable. Only a segment of the learners demonstrate proficiency. As we have evolved as a teaching community through equitable use of instructional strategies through the orchestration and refinement of our math program, greater numbers of our students have begun to demonstrate proficiency, and the achievement gap has narrowed significantly. The effort has involved leadership among the administrators but to a greater degree leadership among the teaching staff. Teachers understand that their students are learning more efficiently because the teachers are using their instructional toolboxes more effectively. The change is consistent and systemic. Through hundreds of observations and walk-through visits, it is evident throughout our elementary classrooms that high expectations for math learning are the same no matter where between the two mountains your school building lies.

Now that we have a level of consistency with the math instruction in the classrooms, we are better able to look at areas where the success rate

for our students in math may still not be as strong and determine what other factors or challenges may be impeding student success. We can devise additional methods to support the students to be successful learners. One of our schools was able to boost proficiency rates from 75% math proficiency for Grades 3 through 5 up to 90% in one year by implementing a Saturday Academy for identified children at risk. The population of students is 57% economically disadvantaged, which is considerably higher than our district average. The teachers for the Saturday Academy were provided materials that were aligned with the daily classroom instruction. Teachers were able to target areas where students had gaps in their understanding and then scaffold the learning. By maintaining the common math language, continuity of the expectations, and the use of instructional strategies that the students were familiar with, the program was successful in supporting student achievement.

Not long ago, I stopped by one of my buildings to see a teacher. While I waited for her preparation to begin, so that we could discuss a lesson I had observed earlier in the week, another of my teachers approached me. She was telling me about how she had recently hosted a visit from a teacher from another school district who came to see what we were doing in math instruction. Her guest wanted to watch her teach and ask questions about what worked and what advice she would share. The neighbors wanted to see what we were doing! How awesome!

Hopefully, sharing the story of the work of the teachers and students in West Orange's elementary schools will contribute positively to the conversation that equity in instruction can support accomplishment for all students. In the classroom, focusing on students' need for some does not prevent good teaching for others, and the data prove this. In our district, the average mean scale scores in the elementary-math program have risen, in concert with the number of students leaving partial proficiency behind. If there is reservation on the part of parents of noneconomically disadvantaged students that is based on a concern that when teachers focus on students with needs, their own children will receive less opportunity to grow academically, I can only point to the data that we are generating in our district to show that a diverse learning environment benefits all students. For our students who are economically advantaged and are classmates in diverse classrooms, the data show that this subgroup of students has experienced growth, too! In our district, the achievement of these students has risen to more than 91% proficiency in mathematics, and within that group, nearly 60% are advanced proficient. Even with increasing diversity in the classrooms, our most advantaged students have excelled. All students have needs, even the academically and economically advantaged. A teacher who promotes a student-centered environment and

understands how to scaffold instruction to support gaps for one student will use that same set of skills to extend the progression of learning for the child who is ready for more.

A parent recently approached me to ask how to help her child during the summer months to prepare for the challenges of the next school year's math. As we reviewed materials and discussed the progression of skills, she shared with me an earlier discussion she had with her husband about possibly moving to another school district. They were concerned that being in such a diverse district might be an educational disadvantage, and they wondered if they would better serve their child by moving to a nearby district that had a reputation for being successful, and which I knew to be more economically homogeneous. She told me that a friend, who was also an attorney, questioned why she would do that, when the West Orange school that her child was already in was more successful than the school she was thinking of moving to. He was able to show her information on the computer that confirmed his statements.

I appreciated her candor, as well as her desire to advocate for her child, but it made me uncomfortable to know that this parent did not know about our success, and that this lack of information might have contributed to a decision to leave our school community. We have the responsibility to communicate this success to our parents, and perhaps this is the next step in the process for us.

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