

1 DISTRICT, 1 SET *of* MATH GOALS

The top-performing school systems recognise the only way to improve outcomes is to improve instruction ... They have understood which interventions are effective in achieving this — coaching classroom practice, moving teacher training to the classroom, developing stronger school leaders, and enabling teachers to learn from each other — and have found ways to deliver these interventions throughout their school system.

— McKinsey & Company, 2007, p.26

By Timothy Kanold and Jhone Ebert

In March 2008, teachers and leaders of the mathematics programs grades 6-12 in the Clark County School District (Las Vegas, Nev.) found themselves under the urgent spotlight of failed expectations. District leaders and teachers had been bold enough to create high-stakes, districtwide common assessment semester exams in five subject areas of mathematics to be used by every middle and high school in the district. These assessments included middle school pre-algebra and honors algebra as well as high school algebra, geometry, and advanced algebra II. In January 2008, 56 middle schools, 48 high schools, and 24,000 students participated in the districtwide semester common assessment. When only 9% of the students tested were able to pass the high school algebra I first-semester common assessment, the results grabbed headlines and the attention of all stakeholders — administrators, board of trustees members, teachers, curriculum leaders, and community members throughout the district.

In response to the overall results, the superintendent established the expert mathematics committee. The committee consisted of stakeholders from throughout the school district, including K-12 mathematics teachers, 6-12 department chairs, K-12 building principals, assistant principals, area superintendents, leaders in the curriculum and professional development program, the testing and evaluation department, along with outside experts from the University of Nevada Las Vegas, the Regional Professional Development Program, and the national mathematics leadership community.

In spring 2008, the district — the 5th-largest in the nation — embarked on a continuous growth and improvement journey in mathematics professional development and learning with clear directive for improvement from the board of trustees, the superintendent, and the deputy superintendent for instruction. This systemic district initiative provided a coherent focus and sustained collaborative effort for improved mathematics achievement by establishing and monitoring nonnegotiable goals for student achievement at both district and school levels. After two years of mathematics-specific professional development, many district schools have exceeded student performance expectations and reached new levels of achievement.

SETTING ACHIEVEMENT GOALS

In *District Leadership That Works*, Marzano and Waters (2009) reveal keen insight into research for effective districtwide leadership for improved student achievement. They suggest that:

1. Nonnegotiable district goals should be established for student achievement and for effective instruction. These goals should be monitored and used as the basis for immediate and corrective action.
2. These nonnegotiable goals for achievement and instruction should be established through a collaborative goal-setting process that involves key stakeholders (p.22).

This is where the serious work of the expert mathematics committee began. The committee examined previous years' trend data in two critical areas of student achievement for five district mathematics college prep core courses: middle school pre-algebra and algebra; high school algebra I, geometry, and advanced algebra II. These areas of district student performance included:

1. Student pass-rate performance data on the first- and second-semester district common assessments.
2. Student semester-grade distribution rates, where we examine particularly the percentage of those who receive grades D and F, which we call the D/F rate.

As recommended by Marzano and Waters, the committee used consensus building to establish both long-term (three-year target goals for district improvement) and short-term target goals (for results by the end of each semester in 2008-09). These nonnegotiable student achievement improvement goals were designed to fit seamlessly into the already established district school improvement plan and quality assurance framework by using the SMART goal protocol from Conzemius and O'Neill (2002).

PROFESSIONAL LEARNING

Once the expert mathematics committee established district targets for improved student achievement, they began a review of research using the *Principles and Indicators for*

Clark County School District SMART goals and results

A SAMPLING

COMMON ASSESSMENT PASS RATE GOAL:

We will increase the high school algebra I common assessment pass rate to **80%** by the 2011-12 school year.

| Interim goal | Achieved |
|--|----------|
| 9%-35% 2008-09 school year, first semester | 17% |
| 11%-35% 2008-09 school year, second semester | 12% |
| 17%-35% 2009-10 school year, first semester | 21% |

GRADE DISTRIBUTION GOAL:

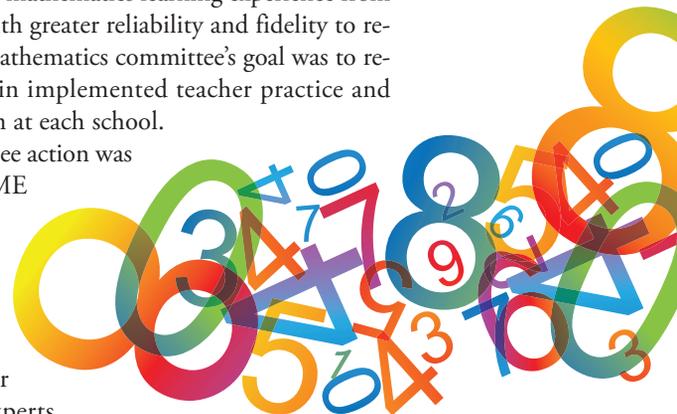
We will decrease the middle school pre-algebra D/F rate to **10%** by the 2011-12 school year.

| Interim goal | Achieved |
|--|----------|
| 35%-25% 2008-09 school year, first semester | 37% |
| 41%-31% 2008-09 school year, second semester | 41% |
| 37%-25% 2009-10 school year, first semester | 33% |

Mathematics Education (PRIME) Leadership Framework from the National Council of Supervisors of Mathematics. The committee studied vital teacher actions directly linked to improved student achievement in mathematics. The mathematics committee recognized the importance of using district leaders and mathematics department chairs to close the knowing-doing gap between “knowledge about how to enhance student achievement and the commitment to actions we must take as a result of that knowledge” (2008, p.56).

Subsequently, the committee established several district professional development initiatives and adult actions for mathematics tied directly to the district SMART goals for each course. This established greater coherence and improved rigor to the student mathematics learning experience from school to school with greater reliability and fidelity to results. The expert mathematics committee's goal was to reduce the variance in implemented teacher practice and student preparation at each school.

A primary committee action was to provide PRIME leadership professional development for 128 middle schools and high school department chairs four times per year. National experts,



members of the district curriculum and professional development division, and the regional professional development program collaboratively led these meetings.

The professional development of department chairs included:

1. **Creating and implementing school and departmental SMART goal plans.** At the school level, SMART goal plans, designed using site student achievement data, were aligned with district-level SMART goals for each of the five mathematics courses. Mathematics department leaders worked with their respective course-based teacher teams to create SMART goals that advanced the district goals and address gaps in mathematics achievement expectations for all student populations.
2. **Creating and implementing high-performing teacher teams in mathematics.** The expert mathematics committee recognized the power of teacher collaboration in professional learning and used a collaborative teacher team model as a basis for erasing inequities in student learning. Both the district and the committee realized that a hallmark of teacher leadership is the ability to help teachers collaborate with one another and work interdependently to establish best practice teaching in mathematics. Although a work in progress, the committee established the teacher team as the smallest unit of change in the department, rather than the individual isolated classroom teacher.
3. **Creating and implementing mathematics-specific instructional design tasks.** This included high cognitive demand or depth of knowledge task instruction in algebra and geometry. Essential design questions were developed as an expansion of the district's locally developed components of an effective lesson to help each mathematics teacher plan each day. Accepting the PRIME Leadership Framework challenge that "every mathematics lesson must be focused on relevant and meaningful mathematics and support research-informed best practices" (2008, p.5), the mathematics department chairs participated in extensive discussions about implementing effective practices in every classroom. These discussions included strategies to ensure student-engaged learning and rigor in task assignment and selection and the development of relevant and meaningful mathematics lessons every day.
4. **Creating and implementing highly effective classroom assessment practices.** Using the PRIME Leadership Framework as well as identified best assessment practices throughout the district, the department leaders assessed the quality of school unit tests using a test evaluation rubric developed by the expert mathematics committee and experienced by the department chairs as part of the quarterly professional development. The department chair assessment professional development included more consistent and rigorous grading practices for every mathematics course. Some schools also established formative assessment loops for student and adult feedback.

ESTABLISHING HOLISTIC DISTRICT PRACTICE

The expert mathematics committee also played a central role as advisory to the district's curriculum and professional development department and the school board.

The committee established these vital district mathematics behaviors:

1. **Changes in the mathematics course sequencing grades 6-12, which significantly streamlined the total number of course options and provided guidelines for student access to the college preparatory mathematics curriculum.** Mathematics is unique in that it is saddled with the burden of being a vertically connected curriculum. The committee recognized a strong need to ensure the vertical connections in the proper course scope and sequence were consistent across the district.
2. **Changes in student placement procedures from 8th to 9th grade (currently in the second year of a pilot) as well as 5th to 6th grade (under development).** The intent of these changes is to create a coherent, fair, and equitable process throughout the district and to reduce the variance from school to school.
3. **Changes in Response to Instruction (RTI) for struggling students and, most importantly, an intentional and non-negotiable school response to the early preparation of students for local semester common assessments.** Preparation for these high-stakes tests was no longer an option for the district's teachers and all teacher teams.
4. **Changes in ongoing professional development for mathematics teachers.** Over a two-year period, the district focused mathematics professional development on teaching and assessment leadership with an eye on erasing inequities caused by the previously wide variance in teacher practice from school to school. Mathematics teachers participated in course work connected to improvement through the University of Nevada Las Vegas and Saturday lesson studies using Title I ARRA funds. This professional development provided the venue for teachers to not only collaborate but to own their daily work with students. Many of the district's expert mathematics teachers taught one another during these meetings and seminars.

MONITORING CONTINUOUS IMPROVEMENT AND CELEBRATION

Perhaps the most important role the committee has served toward the gradual improvement of student achievement in Clark County School District is its willingness to keep its collective shoulder pushing hard on the wheel of continuous improvement (Kanold, 2006). In January 2009 and again in January 2010, the committee led a review of school-by-school performance on the SMART goal expectations and action plans for the district as well as the SMART goal expectations at each site. Many SMART goal plans contained corresponding adult ac-

tions congruent with expectations of the professional development of the mathematics leader and department chairs.

In reviewing each school's results, the committee asked, which schools surpassed the district student achievement goals for improvement? Which schools surpassed their local site improvement goals for each course? Which schools and which courses demonstrated the most improvement? Which schools did not meet district goal expectations or surpass their local standard? What could the mathematics department or course-level team of teachers do differently to improve? The data review included semester grades — a subjective teacher measure — and the semester common assessment pass rate — an objective standard of rigor measure — for each of the five courses targeted for improvement.

These dual SMART goals allowed the expert mathematics committee to examine school data results that might not be in alignment. Low D/F grade rates with high failure rates on the common assessments would indicate soft levels of rigor for assigning grades. High D/F rates with low common assessment failure rates would indicate that the teacher or teacher team is too rigorous in assigning course grades.

The focused efforts of the committee, the mathematics teachers, the teacher leaders, and the professional development leaders resulted in new levels of student performance in 2010. A review of the first-semester common assessments data in 2010 revealed more than 15,000 students passing the exams than would have passed based on 2008 levels of proficiency. Paying

attention to results and acting on those results was rewarded by short-term improvement. See a sampling of district SMART goals and results on p. 13.

The antidote to constant tension caused by a continuous improvement culture is celebration. Each January and February, the district, with help from the mathematics committee, celebrates the achievement of SMART goals at each school. Celebrating in community is an essential part of a viable and healthy school culture. Critical to the celebration was the support and recognition from district leaders. The deputy of instruction, area superintendents, curriculum leaders, and teacher peers were given time to address department chairs and acknowledge the accomplishments for the course-based professional learning community school teams.

SEEKING SUSTAINABILITY

One of the most difficult aspects of any systemic change is ongoing sustainability. Clark County School District has made a public declaration to stay focused on continuous improvement to ensure student academic success.

The district is ensuring that all aspects of the teaching and learning environment in mathematics are monitored for improvement. Striving to provide transparency in all areas of such a large district is not easy to do, but essential to sustaining a reliable effort around teaching behaviors that impact student learning.

As the expert mathematics committee and the district review the work done to date, they acknowledge the major structural changes that have been made in the past two years, yet they know the changes must be supported by ongoing monitoring of student achievement and faculty actions.

The district plans to strengthen its classroom support more directly. Next steps include deep inspection of the teaching culture and learning at individual schools that need to improve. Classrooms with struggling students need to be provided just-in-time resources to help students meet district expectations. As the McKinsey report indicated, the top-performing school systems “improve instruction by moving teacher training to the classroom” (2007, p.26).

As district mathematics teacher leaders and teacher teams become more confident and capable of working together, they will eventually reach the ultimate goal of sustainability and unlimited possibility.

REFERENCES

- Conzemius, A. & O’Neill, J. (2002).** *The handbook for SMART school teams.* Bloomington, IN: Solution Tree.
- Kanold, T. (2006, Spring).** The flywheel effect: Educators gain momentum from a model for continuous improvement. *JSD*, 27(2),16-21.
- Marzano, R. & Waters, T. (2009).** *District leadership that works: Striking the right balance.* Bloomington, IN: Solution Tree.
- McKinsey & Company. (2007, September).** *How the world’s best-performing school systems come out on top.* New York: Author.
- National Council of Supervisors of Mathematics (2008).** *The PRIME leadership framework.* Bloomington, IN: Solution Tree.

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Clark County School District

Las Vegas, Nev.

Number of schools: **352**

Enrollment: **309,476**

Staff: **38,523**

Racial/ethnic mix:

| | |
|-------------------------|--------------|
| White: | 34.6% |
| Black: | 14.1% |
| Hispanic: | 41.0% |
| Asian/Pacific Islander: | 9.6% |
| Native American: | 0.7% |
| Other: | 0.0% |

Limited English proficient: **30%**

Languages spoken: **134**

Free/reduced lunch: **43.2%**

Special education: **10.4%**

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