IDRA Focus: Curriculum Quality

INTERCULTURAL DEVELOPMENT RESEARCH ASSOCIATION

IDRA Newsletter

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Re-Invigorating Math Curricula

by Kathryn Brown

Inside this Issue:

Curriculum quality is a key element of IDRA's Quality Schools Action Framework (Robledo Montecel, 2005). IDRA believes that this key element has to be in place to ensure a quality education for *all* students, in all content areas, in all schools and at all grade levels.

When you think of quality mathematics curricula, what do you envision? Massachusetts Institute of Technology professor and world-renowned mathematician and educator, Seymour Papert asks us to think of curricula in a new way, replacing a system where students learn something on a scheduled day, with one where they learn something when they need it in an environment that shows meaning and gives context as to why it is being learned. It is student-centered where students use what they are learning (Curtis, 2001).

Think for a moment what you would expect… teachers doing and saying; students doing and saying; and parents doing and saying. Reflect on the outcomes and possibilities that would unfold for students, families, teachers and the community if all schools had a quality mathematics curriculum in place.

Standard of Quality Math Curriculum

The National Council of Teachers of Mathematics includes in its Principles and Standards for School Mathematics the curriculum principle: "A curriculum is more than a collection of activities: it must be coherent, focused on important mathematics and well articulated across the grades" (2000). This principle provides a framework in which to make instructional decisions and policies that impact student success and achievement in mathematics.

A quality mathematics curriculum must be vertically aligned, connecting and building upon concepts within and across grade levels, engaging students in meaningful mathematics where they see the value of learning the concepts, and facilitating the development of a student's productive disposition toward mathematics (NCTM, 2000; Kilpatrick, et al., 2001).

Throughout Texas, school districts have invested many resources in creating a variety of curricula in

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attempts to meet national and state standards. A shift has occurred over the past decade from the optional use of course curricula to a more pervasive and monitored use. Although use of district mathematics curricula is more often the case than not, the quality of such curricula spans many levels:

- Mediocre test-driven curriculum where the only expectation for students is to pass a punitive, high-stakes standardized test;
- Scripted lessons and timelines detailing verbatim what teachers will say and dictating what materials will be used, leaving no room for teacher creativity or student investigation; or
- Highly challenging and engaging curriculum that is standards-driven and that values teacher's professional expertise and values students as mathematics learners.

Sample Process Used in Math Smart!

IDRA models the development of highly challenging and engaging curricula through its Math Smart! program. Math Smart! integrates the Five Dimensions of Mathematical Proficiency with strategies for engaging students, dynamic technology tools for building and deepening student mathematical thinking, strategies for supporting English language learners, and strategies for engaging and valuing parents through a variety of methods. The process is outlined below.

Curriculum development becomes a collaborative effort and parallels what we want to happen in the classroom, where communication and discovery is two-way: students and teachers participating in conversations about mathematical ideas.

Planning with Teachers

Planning sessions are an opportunity for mathematics teachers to reflect on math concepts and their teaching practice. In a planning session IDRA held with Math Smart! Algebra I teachers at one school, teachers reviewed the timeline and discussed how they were exploring the concepts of quadratic functions, finding roots, maximum and minimum values, and evaluating the functions with their students.

Teachers wanted to put into practice elements of the Math Smart! program in the curriculum and lead into polynomials and polynomial properties. What resulted was a deep discussion on how to bring to life quadratic functions, roots and maximums through kicking a soccer ball or football and using physics.

A plan for integrating non-traditional, brain-researched teaching strategies where students discover and present their own methods for simplifying polynomials, finding roots and real-life applications was also developed from the discussion among teachers.

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In This Issue...

The Intercultural Development Research Association *(IDRA)* is a non-profit organization with a 501(c)(3) tax exempt status. The purpose of the organization is to disseminate information concerning equality of educational opportunity.

The *IDRA Newsletter* (ISSN 1069-5672, © 2006) serves as a vehicle for communication with educators, school board members, decision-makers, parents, and the general public concerning the educational needs of all children in Texas and across the United States.

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IDRA's Transitions Project

Promoting Excellence in Teaching through a Highly Qualified Teaching Force

by Linda Cantú, Ph.D., and Adela Solís, Ph.D.

An important goal of school districts is to have sufficient numbers of teachers highly qualified to teach rigorous content and using the most cutting-edge pedagogy indicated by the latest research. Reaching this goal has been hampered for some time by various factors, such as teacher attrition and increasing student enrollments (U.S. Department of Education, 2005).

Schools are finding it especially challenging to fill the shortages of highly qualified teachers in the field of English as a second language (ESL) and bilingual education (Chauncey, 2005). The impact of this problem is especially felt by children who are English language learners. For the 2004-05 school year, there were 631,534 English language learners in Texas comprising 14.4 percent of the student population (Texas Education Agency, 2005).

Transitions and the Bilingual/ ESL Teacher Need

IDRA's project, Transitions, is funded by the federal Transitions to Teaching program to assist school districts in meeting their goals and the *No Child Left Behind Act* (NCLB) requirement that all teachers in all academic subjects be highly qualified by 2005-06. The Transitions project assumes that only through a force of talented and caring teachers can English language learners achieve high standards. Its work is crafted to ensure that this occurs.

Transitions is expanding and improving current educator preparation programs to create shorter routes to certification and academically-rigorous training experiences. By doing this, English language learners will benefit by having sufficient numbers of qualified and motivated teachers.

The field of ESL and bilingual education struggles because the number of students who need these teachers' skills grows every year. In one year, between 2004 and 2005, the number of English language learners in Texas increased by 4.2 percent. At the same time, there is a shortage of ESL and bilingual teachers altogether. In 2004-05, for example, there were 24,790 ESL and bilingual teachers (an increase of about 5,000 from 2002-03). This year, if the average class size for grades kindergarten through six is 20 students, there would be a need for about 31,576 ESL and bilingual teachers, with a shortage of 6,786 of these teachers. Transitions provides an excellent opportunity to create sufficient numbers of highly-qualified teachers.

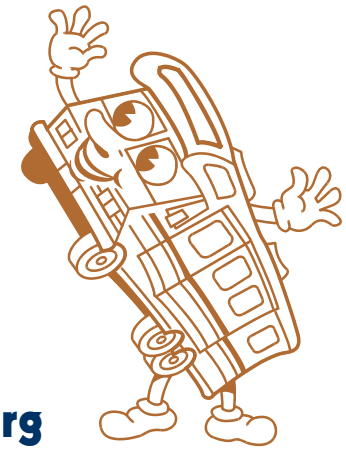
Transitions Project *– continued on Page 4*

Take the IDRA Newsletter Field Trip!

On IDRA's Web Site

- Read related *IDRA Newsletter* articles from 1996 to the present
- Access statistics, definitions, etc.
- Learn about Internet resources
- Find extensive useful Internet links
- Use IDRA's topical index to find what you are looking for

www.idra.org



Transitions Project *– continued from Page 3*

Transitions Model and Implementation

Transitions, as a five-year project, is enabling school districts to tap into new groups of professionals with outstanding credentials and bilingual skills as prospective bilingual education and ESL teachers. The project has the following components: (1) early identification and recruitment; (2) pre-service training for certification and placement; and (3) sustained in-service training and professional development, mentoring and support.

Through these components, Transitions conducts the following activities: high-quality pre-service coursework, payment of tuition and related expenses, teaching internships, mentoring and other new teacher support, and sustained in-service and professional development, including strategies to influence retention.

Under NCLB, teachers participating in an alternative teacher program, such as Transitions, will be considered "qualified" and begin their certification program as teachers of record. This project is specifically recruiting and preparing mid-career professionals and recent college graduates who have content expertise in core subject areas and who are linguistically prepared and culturally competent for certification in ESL and bilingual education.

Over the five years, the project intends to identify and recruit 150 second-career professionals and recent college graduates and to provide pre-service training for certification and support to ensure that candidates become fully qualified to teach in ESL and bilingual classrooms.

Subsequently, Transitions will place and support the retention of qualified participants in ESL and bilingual classrooms within partner high-need school districts by:

- Placing successful participants as teacher interns during the teacher preparation and credentialing phase, and
- Providing project participants with mentoring, specialized support and high-quality in-service training during the certification process and one year beyond.

IDRA is partnering with several Texas universities, colleges and school districts to prepare and place eligible teacher candidates in teaching positions in high-need school districts. Teachers participate in classes at the college, university, or school district in content and pedagogy, and they receive intensive sessions and classes to prepare them to successfully pass the required certification exams.

Once teachers are hired by school districts, IDRA provides additional support to these first-year teachers in the form of *platicas* (discussions) and other professional development to strengthen their confidence and teaching skills.

In addition, the candidates are assigned an IDRA mentor during their first two years of teaching. This mentor, an expert bilingual professional, works cooperatively with the school-assigned mentor and the university teacher supervisor. The IDRA mentor holds monthly sessions with the Transitions teachers. IDRA mentors can provide an array of in-class assistance including: (1) observations and feedback; (2) lesson demonstrations; (3) co-teaching a lesson; (4) lesson planning to incorporate Texas Essential Knowledge and Skills (TEKS) objectives; (5) room arrangement and setting up learning

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Transitions Project *– continued from Page 4*

centers; and (6) creating positive discipline and other areas considered essential for teacher success.

Calling Potential Highly Qualified Teachers

Transitions is in its first year of operation in the Dallas/Fort Worth, East Texas, Houston, Laredo, Rio Grande Valley and San Antonio. The school districts meet specific criteria that qualify them as high-need school districts and typically have needs for bilingual and ESL teachers in grades pre-kindergarten through four. These schools share the IDRA goal and commitment to bring a talented and caring cadre of professionals to their schools, where there await numbers of bilingual children eager to excel academically and fulfill their aspirations to become happy and well-educated bilingual adults.

Recruitment is underway to attract professionals from other fields with outstanding qualifications to transition into teaching and make their careers as highly-qualified bilingual and ESL teachers.

For more information contact Dr. Linda Cantu at IDRA 210-444-1710 or e-mail linda.cantu@idra.org.

Resources

Chauncey, C., ed. *Recruiting, Retaining and Supporting Highly Qualified Teachers*. (Cambridge, Mass.: Harvard University Press, 2005).

Texas Education Agency. Texas Public Schools Statistics – Pocket Edition, 2004-2005. http://www.tea.state.tx.us/perfreport/pocked/2005/pocked0405.pdf.

U.S. Department of Education. *A Highly Qualified Teacher in Every Classroom, The Secretary's Fourth Annual Report on Teacher Quality* (2005), http://www.ed.gov/about/reports/annual/teachprep/2005Title2-Report.doc.

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Planning that reflects the teaching practice where teachers also explore the actual concepts is an integral part of building a quality mathematics curriculum. Curriculum development becomes a collaborative effort and parallels what we want to happen in the classroom, where communication and discovery is two-way: students and teachers participating in conversations about mathematical ideas.

Thus, quality curriculum development integrates the teacher and the reflection on the teaching practice and mathematics, where district content specialists and teachers participate in collaborative, curriculum development.

Curriculum that Engages Students

Taking what they had planned, teachers developed an activity that engaged students from the moment the bell rang. The following is a sample from one classroom.

Lesson Introduction: Engaging Students – The teacher began the class by telling students that if she knew how long a football they kicked was in flight, she could figure out exactly how high that ball went without having to chase the ball with a meter stick and ladder. None of her students believed her, and they asked her to "prove it."

She proceeded to show them a video that she had downloaded from the United Streaming Video resource (that her school has a subscription to) of classic football games and soccer kicks. Students worked in groups of three, beginning with a warm-up activity (see box on Page 8) that included a timed brainstorm about quadratic functions in their everyday lives. She asked students to sketch a graph of the football in motion from the video.

As a closing to the introduction part of the lesson and to describe the next part of the lesson, she showed a

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Tools for

Quality Curriculum for Student Success

A school's curriculum is its public statement regarding what students who attend the school will learn. A high-quality curriculum is essential to success for all students. Because of the importance of curriculum, school leaders must seize the opportunity to influence and implement such curriculum to make the best use of the limited instructional time available in the classroom (Danielson, 2006).

As such, IDRA's Quality Schools Action Framework (**http://www.idra.org/attrition/framework.htm**) identifies curriculum quality and access as a critical school system indicator. It includes the educational programs of study, materials and other learning resources, such as technology, and their accessibility to all students. It also relates to assessment and accountability – the school practices related to fair and unbiased assessment of students and degree that schools take responsibility for the academic success of all students.

A Snapshot of What IDRA is Doing

Developing Leaders – IDRA's Focusing on Language and Academic Instructional Renewal (FLAIR) project capitalizes on the campus leaders, mobilizing the principal, teachers, librarians and support staff as a force to tailor-make a reading program that is research based and that results in better achievement for all students. Working with the school's teachers and principals, and using the existing curriculum, FLAIR helps transform every classroom into a powerful learning environment, where students and teachers are encouraged to think creatively, explore their interests and achieve at high levels. See **http://www.idra.org/FLAIR/default.htm**.

Conducting Research – Reading Early for Academic Development (READ) is an IDRA project funded by the U.S. Department of Education to establish early childhood "classrooms of excellence" that ensure reading, cognitive and emotional success. The curriculum is the main tool to raise the literacy achievement of preschool children so that they are ready to begin upper level schooling. IDRA has learned through its research in READ, that there is no perfect curriculum for all situations. Our research shows that schools must use a curriculum appropriate for the teachers and students. For example, in South Texas a significant number of children come from Hispanic families.

Tools for Action continued on next page

Action

Thus the curriculum should be bilingual and reflect this cultural diversity in its activities. But a curriculum is only a tool. Teachers need to acquire a deep understanding that the future of these children is in their hands. With this understanding, they need to bring the curriculum alive every day by creating a vibrant atmosphere in the classroom, in which every activity is an opportunity for children to develop their linguistic and academic skills and to reinforce them emotionally.

Informing Policy – IDRA's *Good Schools and Classrooms for Children Learning English – A Guide* is a rubric, designed for people in schools and communities to evaluate five dimensions that are necessary for success. Using the resource tools in this publication, based on IDRA research, IDRA is working with school districts to strengthen policies and procedures for effective bilingual education programs at the school level. For more information visit **http://www.idra.org/Research/goodsch.htm**.

Engaging Communities – IDRA is currently working with a New Mexico school district on a multicultural education framework to make sure that all the populations in the school system are getting an equitable education. Central to the framework are standards-based curriculum, monitoring and evaluation of the education plan for student success, and parent and community involvement and engagement.

What You Can Do

Get informed. Visit the web site for the Association for Supervision and Curriculum Development at **http://www.ascd.org** to learn more about the issues surrounding quality curriculum development.

Get involved. If you are an administrator, provide the space for your teachers (from pre-kindergarten through grade 12) to plan and attend professional development together so that there is vertical alignment in the curriculum being taught and so that teachers can experience and communicate this with their colleagues. IDRA's Math Smart! training encourages that continuum across and within grade levels. See article beginning on Page 1. For information on Math Smart! go to **http://www.idra.org/Services/mathsmart.htm**.

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humorous video of how "not" to kick the football. Humor, not sarcasm, is a highly effective strategy for engaging students. Students were eager to take on the task of finding their own quadratic functions to their kicks.

Experiencing Quadratic Functions – Using soccer balls and stop watches and working in groups of three outside, students kicked the ball and recorded the times the ball was in motion (see activity on Page 8). Many questions about how their graph would change surfaced as they were experiencing mathematics in motion. Students wondered about how the graph would differ if they kicked the ball straight up versus across the field and what if they kicked the ball off the ground versus as it is on the ground.

Every student was engaged in the activity. Part of the success of this is attributed to the physicality of the activity. Students were outside of their sterile classroom, and the soccer field became their lab. The act of doing something helps students remember properties of quadratics, what the roots mean, what the maximum/minimum mean and what happens when we change any of the parameters. They have something to tie it to.

When a student is taking a state-mandated test and comes across a problem asking about the change in a parameter, what will the student call upon – an exact equation that she worked on or the experience that explored what happens if the ball was kicked 0.5 meters off of the ground, how it would affect the graph equation, and the maximum value?

This was an activity that students found valuable. Many of the students were involved in sports and were able to relate their life experiences to quadratic functions.

Bringing it Back to the Classroom – After collecting the data and taking a much-needed water break,

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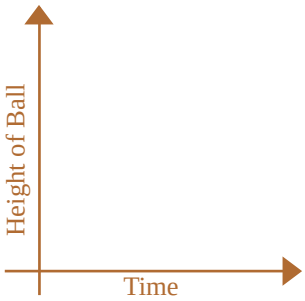
Are You Ready for Some Football?

This is a sample mathematics activity developed by secondary teachers during IDRA's Math Smart! training series. See the article beginning on Page 1 for more information.

Brainstorm for three minutes. Where are parabolas (quadratic functions) in your everyday life?

After watching the video, sketch the graph of a football/soccer ball in motion. Identify on your graph the roots, maximum, when the ball is going the fastest, and when the ball is going the slowest.



Game Plan

1) Get into a group of three people. You will take turns
   a. holding the football,
   b. timing and writing down data,
   c. kicking the football.

2) Each "kicker" gets two kicks. Record the time in seconds for each kick:

Kicker	Kick #1 time in seconds	Kick #2 time in seconds

3) Let's find the quadratic function and graph for your group's kicks. Work as a group to find and verify your calculations. Using what we know about physics and gravity on earth, the form of the quadratic function for a ball in motion is: $d = -5t^2 + V_0t + H_0$

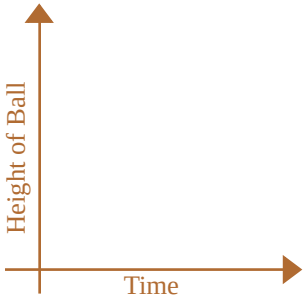
   V_0 = initial velocity in meters/second
   H_0 = initial height in meters
   d = vertical distance or height of the ball in meters
   t = time in seconds

   Fill in the values you know after the ball has hit the ground. Work together as a group to set this up so you can find the initial velocity (V_0):

4) Now that you know the initial velocity, write your quadratic function. For example, if my initial velocity was 25 m/s^2 and I kicked the ball from the ground, my equation would be: $d = -5t^2 + 25t + 0$

Kicker	Kick #1 Time in Seconds	Quadratic Functions	Kick #2 Time in Seconds	Quadratic Functions

Select one of the functions above and sketch the graph at right. Be sure to show the time on the x-axis, various heights of the ball while in motion, maximum height, roots, when the ball is going the fastest, and when the ball is going the slowest.



The "What If" question for your group: What if the ball was kicked 0.5 meter off the ground (like a punt) initially…. What effect would it have on your

- Graph
- Equation
- Roots (What would the left root mean? Does this make sense in this situation? Why or Why not?)

Continue on next page.

Are You Ready for Some Football? continued from Page 8

5) Plan your presentation.
Using the quadratic equation you selected in Step 4, plan your presentation using the white paper and markers. Be sure to divvy up the presentation responsibilities in your group and include the following points:

- How long the ball was in motion, the graph of the motion, and what the quadratic equation is that represents the kick you chose
- What the maximum height of the ball was and how you found it
- What the roots are and what they mean in this real-world situation
- Ask a "what if" question to the class (i.e., What if the ball was kicked with a faster initial velocity? How would it affect the graph?)

Source: Intercultural Development Research Association, 2006

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students went back to the classroom and began using a well-known quadratic function for finding vertical distance to find their own quadratic functions. Using cognitively-guided instruction techniques and building academic language from student's natural language, the teacher was impressed and energized by how students were able to connect to the meaning of the coefficients and constants for initial velocity (v_0), initial height (h_0), and the dependent variable, vertical distance (d).

Students discussed in groups and shared with the whole group the meaning of the roots and the maximum in their own graphs, connecting them to their real-life application. Students said such things as: "The first root is where time and distance are both 0, or the origin, because I had not kicked the ball yet, and the second root is when the ball landed, and also the vertical distance is 0. This connects to when our teacher explained that the roots are where the parabola crosses the x-axis."

Another student explained initial velocity as to how fast it is going at kick-off, but then the ball slows down because it is going up but gains speed as it is coming back down and will reach that velocity again right at the moment it lands.

These are highly complex mathematical ideas that students so readily explained as the meaning of the function $d = -5t^2 + V_0t + H_0$ was being explored in conjunction with the graphs they had sketched.

It also enabled the teacher to bring in the idea of instantaneous rate of change, a concept formally presented in Calculus I, to her Algebra I students. This teacher has the expectation for *all* of her students to go on to Calculus I. It shows in statements she makes, such as, "When you get to calculus, you will hear the term 'instantaneous rate of change' to describe how fast the ball is going along the path."

Finding the Functions and Making Conjectures – Students readily volunteered to present to and get guidance from each other in trying to figure out how they would first calculate the initial velocity as it was easy to find the initial height (which was 0 because the ball was on the ground when it was kicked). One student volunteered that even though he "didn't know what to do," he would "get help from the class." The class eagerly helped him, justifying and bringing in ways that they knew how to "do the math" (i.e., solve equations to find the initial velocity given the time and the vertical distance after t number of seconds). Once students found the initial velocity, they were able to write their very own quadratic function describing their own kicks.

Students Challenging Students – The beauty of mathematics is in the "what if's" – variables changing, parameters and coefficients changing, and analyzing what it all means and how it applies. Using an engaging activity paves the way for students to begin thinking of "what if" questions. It gives them the *experience* of mathematics.

As indicated above, students began asking the "what if" questions when they were out in the field collecting data. It was natural for them to do this, without being prompted by the teacher. Students were able to answer their questions using their graphing calculators, quadratic functions and natural mathematical reasoning abilities.

In closing the activity, students had to present one of the quadratic functions from the group, indicating the roots, the maximum height of the ball, why they chose that kick, and a what if question to their fellow classmates. Some of the questions included: what if we were on another planet where the gravity is not so strong, what do you think the graph would look like? And, what if I kicked the ball at a faster initial velocity and it was three feet off the ground, how would my equation change?

Wanting More

As a result of planning and of teachers' experiencing with students

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a highly challenging and engaging activity that had them involved in mathematical conversations, these Math Smart! teachers wanted to continue to contribute to the district curricula and include collaboration and teaching practice reflections as an ongoing way of ensuring a quality mathematics curriculum for their students.

IDRA and the teachers were able to explore a model for creating a quality mathematics curriculum: reflecting on current curricula, sharing ideas on how to get students involved and appeal to their interests so they find mathematics valuable, using available resources, breaking out of traditional one-way conversations into two-way conversations with students about the mathematics, and realizing that as time and technologies change, so too will the curriculum.

Quality curriculum is dynamic; involves teacher practitioners in ongoing reflection, development and refinement; values students' experiences and the knowledge they bring; and is rigorous and vertically aligned so that students are not only prepared to enter higher-level mathematics courses, but also experience higher-level mathematics within their current courses.

Resources

Curtis, D. Start With the Pyramid (San Rafael, Calif.: The George Lucas Educational Foundation, 2001), http://www.edutopia.org/php/article.php?id=Art_884&key=037.

Kilpatrick, J., and J. Swafford, B. Findell (Eds). Adding it Up: Helping Children Learn Mathematics (Washington, D.C.: National Research Council Mathematics Learning Study Committee, November 2001).

National Council of Teachers of Mathematics. Principles and Standards for School Mathematics (Reston, Va.: National Council of Teachers of Mathematics, 2000).

Robledo Montecel, M. "A Quality Schools Action Framework – Framing Systems Change for Student Success," *IDRA Newsletter* (San Antonio, Texas: Intercultural Development Research Association, November-December 2005).

Kathryn Brown is the technology coordinator in the IDRA Division of Professional Development. Comments or questions may be directed to her via e-mail at comment@idra.org.

Highlights of Recent IDRA Activities

In **February**, IDRA worked with **3,497** teachers, administrators, parents, and higher education personnel through **39** training and technical assistance activities and **134** program sites in **11** states plus Brazil. Topics included:

- Parent Leaders: An Untapped Resource in Education
- Transition to Teaching – Evaluation
- Analyzing and Interpreting Student Data
- HeadsUp! Reading Enhanced
- Eliminating the Achievement Gap

Activity Snapshot

During IDRA's 12th Annual *La Semana del Niño* Early Childhood Educators Institute, more than 250 teachers, administrators and parents participated in a series of information-packed development sessions that were customized to their varied concerns. This institute provides the nation's only gathering place for teachers and parents concerned with early childhood education of English language learners. The institute participants explored, assessed, and reflected on research-based, effective practices that lead to children's success. The teachers, administrators and parents attended workshops about creating opportunities for children to develop a love for reading while they are doing mathematics, art, music and science. This institute is being held again this month. See Page 12 for information.

Participating agencies and school districts included:

- Hidalgo Independent School District (ISD), Texas
- National Dropout Prevention Center, Washington, D.C.
- Taos Public Schools, New Mexico

Regularly, IDRA staff provides services to:

- public school teachers
- parents
- administrators
- other decision makers in public education

Services include:

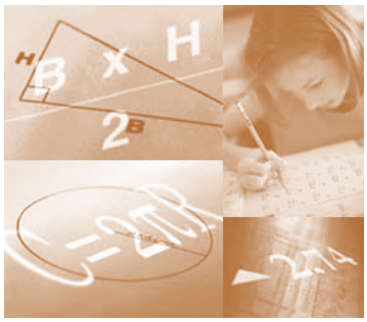
- training and technical assistance
- evaluation
- serving as expert witnesses in policy settings and court cases
- publishing research and professional papers, books, videos and curricula

For information on IDRA services for your school district or other group, contact IDRA at 210-444-1710.

IDRA's

Math Smart!

Mathematics Process to Maximize Student Learning in Mathematics



In supporting equal access to challenging mathematical content, it is critical to implement instructional practices shown to be effective with linguistically diverse and economically disadvantaged students. Traditional secondary level practices simply are not enough in the instruction of heterogeneous populations.

To maximize mathematical proficiencies and impact student achievement, instructional and administrative staff must be prepared to address different needs in an age of increasing expectations and mandatory accountability for diverse students. It is no longer enough for students to simply "do well" on state-mandated exams. It is necessary to increase the understanding, complexities and applications of mathematical thinking and processes across all math courses in order to satisfy state and federal mandates and prepare our students for an ever competitive job market.

To address these issues, IDRA's Math Smart! presents a shift in mathematical thinking for instructors, that develops the Five Dimensions of Mathematics using scientifically-based research strategies.

Math Smart! Objectives

- **Strengthen the belief** that all students can increase their achievement in state-mandated exams and that students' understanding of mathematics can be deepened to levels of increasing complexity.
- **Value students' experiences** as a basis for strengthening their mathematics competency.
- Take advantage of a **safe environment to explore mathematical concepts** in new ways and to support peer collegiality among math teachers who are experiencing success.
- Move from a traditional math instruction approach to a broader paradigm that makes it possible to say that **all students really can learn mathematics**.

Call IDRA today! 210-444-1710

IDRA Support

Math Smart! training uses a variety of ways to work with school staff who can include workshop training, video conferences, demonstration lessons, pre-classroom observations, project listserv web casting, online discussions and reflections. The Intercultural Development Research Association provides the following support for face-to-face and online coaching and mentoring sessions:

- Implementing the five dimensions of mathematical proficiency in a standards-based curriculum,
- Using cognitively guided instruction: Questioning techniques, teacher strategies, and building the classroom environment,
- Ongoing assessments of instructional efforts,
- Differentiating instruction in the mathematics classroom,
- Developing literacy skills (writing, reading, and building language in mathematics),
- Implementing cognitively challenging TAKS/TEKS aligned strategies for student success in math, and
- Supporting teachers through mentoring and coaching strategies.

Math Smart! Will Address Your Specific Needs

Cross-cutting themes that are incorporated into each training session include:

- "Helping Second Language Learners Excel in Math"
- "Kicking the Door Open: Increasing Student Enrollment and Achievement in Higher Level Mathematics"
- "Directing Instruction to Guide and Empower Student Mathematical Thinking"
- "Creating a Hands-On, Problem-Solving Environment to Energize Student Learning in Mathematics"
- "Propelling Student Thinking in Math Using Technology"
- "Engaging Parents to Ensure Student Success in Math"

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