# NOTICIAS de TODOS

**News from TODOS: Mathematics for ALL**

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**Fall 2007** **Volume 3, Number 2**


**IN THIS ISSUE**:



*The mission of TODOS: Mathematics for ALL is to advocate for an equitable and high quality mathematics education for all students, in particular Latino/Hispanic students, by increasing the equity awareness of educators and their ability to foster students' proficiency in rigorous and coherent mathematics.*

## Advancing Equity and High Quality Mathematics Education with Actions Drawn from Ethnomathematics

by Fredrick L. " Rick" Silverman, Gary H. Fertig, Jennifer Harding-DeKam, and Susan Conklin Thompson

Let's implement experiences in mathematics education that advance the aims of creating more peace, harmony, and respect in our world! Striving to achieve that goal has a place in the classroom. That's the perspective that Ubi D'Ambrosio (2006a, 2006b) has expressed as a critical element of Ethnomathematics, an element that can be a foundation for a mathematics education framework that promotes high quality mathematics education for all students, thus advancing the increasingly urgent need for equity in teaching and learning mathematics. Let there be no more students whom our mathematics education teaching, programs, curricula, or leaders, wittingly or unwittingly, marginalize! D'Ambrosio, one of the founders and international leaders of Ethnomathematics, urges that mathematics educators organize and lead students for constructing mathematical knowledge based on harmony among individuals, society, and nature.

Harmony in this vein means enacting mathematics education that is more inclusive of all students than is common practice. Hence, this essay advocates for access to equitable and high quality mathematics education for all children, and especially for those whose home language is not the language of the school, for children of poverty, for minority children, for children whose families are mobile, for children who have special needs, and for all other children whom for one reason or another the school experience often marginalizes. And let us not forget that school mathematics experiences for girls and young women have frequently been seriously lacking. Too often, mathematics education has been an elitist discipline and has had the effect of advantaging some students while disadvantaging others by the exclusivity of the processes, unintentionally or intentionally, by which they encounter mathematics during formal school lessons in the discipline, lessons that have been short on developmental, cultural, or social appropriateness.

Mathematics education can be a contributing experience to the cultivation and nurturing of democratic citizenship and democratic dispositions that value diversity that is a hallmark of a plural society that seeks high quality education for all. Such an outcome of mathematics education would certainly lead to a more harmonious society, perhaps even to a more harmonious world. If a teacher promotes such positive societal outcomes, then using open ended problems, seeking and sharing explanations for solutions, appreciating explanations of others, valuing other's points of view, and raising conversations in connection with learning and applying mathematics are means to such a socially beneficial outcome (Simmt, 2001).

On the other hand, such approaches as the following are likely to hinder the cultivation and nurturing of good citizenship, democratic dispositions, and inclusiveness: teaching mathematics as a set of facts, skills, and procedures; teaching mathematics as a fact set that has no utility in the real world - little purpose except for practicing routines for textbook exercises, readying for tests, and preparing for the next year's mathematics course; and teaching mathematics as a discipline in which outcomes

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are either right or wrong, the adjudication of outcomes resting solely with the teacher as authority (Simmt, 2001). Six categories that A. J. Bishop (1988) formulated are an ethnomathematical context, a set of behaviors, in this case, that are inherently encounters with mathematics that children and others have in their lives. Ethnomathematics impels teachers to be cognizant of the styles and techniques that people, including children, use to make sense of the cultural, social, linguistic, and natural environment in which they live. It also evokes learners' interests in the styles and techniques by which others than themselves come to know the world and enact their lives, as when children discover that a game they play and enjoy, perhaps the top-spinning game Toma-Toda from Mexico, is very similar to a game played by children of another culture, as is true with Dreidel, a top-spinning game in Jewish tradition (Zaslavsky, 1998).

Bishop's (1988) six categories in which mathematics arises naturally in people's lives across cultures, societies, and the linguistic landscape are these: Counting, Measuring, Locating, Designing and Building, Playing, and Explaining. Let's look through the lenses of Bishop's categories at a few examples of encounters with mathematics that arise subtly and unmistakably in the lives of many children:

• Biking to and from school and describing the route, which aligns with *locating* and *explaining*
• Playing Rayuela, a hopscotch game from Colombia, aligns with *playing and locating*
• Making miniature furniture with toothpicks and spice drops for *Grandma's Adobe Dollhouse* (Smith, 1984) aligns with *building and designing*
• Buying or trading one sports card for another aligns with *explaining*
• Determining the rate at which water is flowing in the street gutter after a rain aligns with *measuring* and *explaining*

The above examples from children's lives are both mathematical and social behaviors. Teachers who seek, represent, and share examples of mathematics in their own lives are practiced sufficiently to be able skillfully to scaffold their students to do the same. In that way, children learn that mathematics is a discipline of this world, and it is an active, or perhaps more quiet, presence in nearly everything they do. Mathematics lives in social contexts of children and adults, no matter their linguistic, cultural, religious, ethnic, racial, or other personal characteristic, heritage, or way of life. Children sharing their mathematical encounters with one another engenders respect and appreciation of diversity. Teachers who make use of their knowledge of ways children encounter mathematics are in better position to scaffold the link between more formal mathematics learning experiences of the school and the more informal ways in which children experience mathematics outside the classroom. The answer to the question, "When are we ever going to use this stuff?" is, "Everybody uses it every day, already." And then one day after the rain has stopped, the teacher can say, "Let's hurry outside and see how fast the water in the gutter is flowing." Now that's an authentic, substantive, equitable mathematics, and ethnomathematics, experience that might interest just about every child in the class!

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Fredrick L. "Rick" Silverman, mathematics educator and longtime TODOS member, specializes in children's naturally occurring mathematics, integrates mathematics and social studies, and advocates for equity and social justice. He is President of the North American Study Group on Ethnomathematics (NASGEm).

Gary H. Fertig teaches social studies methods to prospective and inservice elementary school teachers and enjoys working with children in the public schools. He coordinates the Master of Arts in Teaching degree program for elementary school teachers.

Jenni Harding-DeKam, mathematics educator, is passionate about mathematics instruction, quality instruction, teacher education, and diversity. She has written articles, grants, and presented the results at conferences. She coordinates the Post Baccalaureate Licensure Program.

Susan Conklin Thompson teaches courses in social studies, early childhood education, and

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multicultural education. Her research interests include social studies, diversity, young children, child maltreatment, social justice, and quality instruction for all children. She coordinates the Early Childhood Teacher Education Program.

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## TODOS Speakers In Demand At Conferences

by Carol A. Edwards

The TODOS Conferences Committee has been busy organizing strands of speakers and recommending TODOS speakers for several conferences. Speakers address the mission/goals of TODOS. Calls for proposals for conferences are sent on the TODOS member listserv.

Some of the conferences in which a TODOS strand has appeared or will appear include:

- National Council of Teachers of Mathematics (NCTM) Annual Meeting and Exposition: 2008 Salt Lake City, 2007 Atlanta, 2006 St. Louis
- NCTM Regional Conferences: 2008 Cleveland, Reno, 2008 O, 2007 Houston, 2007 Richmond
- Greater San Diego Mathematics Council Conference (GSDMC): 2007, 2008
- California Mathematics Council-North (CMC-N): 2006, 2007
- California Mathematics Council-South (CMC-S): 2007
- Conference for the Advancement of Mathematics Teaching (CAMT, Texas): 2008, 2007, 2006
- Los Angeles City Teachers of Mathematics (LACTMA): 2008
- Orange County Mathematics Council (OCMC): 2008
- Northwest Conference: 2007
- XII Conferencia Interamericana de Educación Matemática: 2007

President Miriam Leiva has been a featured/keynote speaker at a number of the conferences. Other TODOS members speaking at these conferences include Martha Aliaga, Cynthia Anhalt, Harold Asturias, Jim Barta, Susan Bohan, Cindy Chapman, Debra Coggins, Elmano Costa, Susana Davidenko, Joyce Fischer, Carol Fisher,


*Yvette Groves and Erin Turner discussed problem posing with diverse 3rd grade classes at NCTM in Atlanta.*

José Franco, Leni Galima, Leslie Garrison, Yvette DeLaTorre Groves, Susie Håkansson, Tere Hirsch, William Jasper, Cathy Kinzer, Janie Kopp, Carl Lager, Noemi Lopez, Michael Lutz, Bob McDonald, Charlene Morrow, Mark Oursland, Lee (Royce) Page, Gregorio Ponce, Nora Ramirez, Jeanne Ramos, Rafaela Santa Cruz, Rick Scott, Lisa Suarez, Mary Swarthout, Sylvia Taube, and Matthew Winsor.

The Conferences Committee members are Carol A. Edwards (AZ, Chair), Elmano Costa (CA), Mari Muri (CT), Carmen Whitman (TX), Harriet Haynes (NY), and Richard Sgarlotti (MI). Past committee members include Don Balka (IN), Anitra Duckett (NY) and Joyce Fischer (TX).

TODOS has a modest Speaker Fund, which was

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Please send newsletter items or articles of interest to: Cynthia Anhalt, canhalt@math.arizona.edu
Subject: TODOS NOTICIAS



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established through donations from Houghton Mifflin Company, Glencoe/McGraw-Hill Co., and Diversified Partners. TODOS speakers are notified of the guidelines and sent an application form three months before the conferences at which they are speaking. A committee reviews applications and recommends funding. The funds are used mainly to supplement other funding and may not cover all expenses. The Speaker Fund Committee members are Carol A. Edwards (AZ, Chair), Odalys Herrera (FL), William Jasper (TX) and Jean Krusi (IA). Past committee members include Joe Zilliox (HI) and Janie Zimmer (PA).

TODOS has received the following special memberships and contributions in the last 6 months.

**Special Memberships:**
*Sustaining*: J. Michael Shaughnessy
**Special Contributions:**
*In Memory of*
Carol Edwards' mother by Melinda Rudibaugh & Rosemary Stastny

All contributions in addition to in honor of, in memory of, should be sent to our TODOS Mathematics for ALL, P.O. BOX 25482, Tempe AZ 85285-5482, attention Miriam Leiva. Also all special memberships, sustaining and benefactors should be sent to Bob McDonald at the same address. TODOS is a 501c3 charitable organization and donations are tax deductible.

Picture from the Annual Board meeting of TODOS held in Columbus, Ohio, September, 2007. McGraw-Hill sponsored the annual meeting.

Pictured from left to right: *Carolyn Moore, SRA/McGraw Hill, National Mathematics Consultant; TODOS leaders: Cynthia Anhalt, Carol Edwards, Miriam Leiva, Susie Håkansson,Deby Valadez, Eleanor Linn, Carl Lager, José Franco, Cindy Chapman, and Nora Ramirez; Lisa Tullos, SRA/McGraw-Hill, Marketing Manager.* Not pictured: *TODOS leader: Bob McDonald.*

## *The Presidents Column:*

By Miriam A. Leiva

As I started to write my usual column for NOTICIAS, I realized that you can get most of the information I give you through our emails and website. So instead, I am writing a more personal message to begin an interactive dialogue among us addressing experiences in teaching and learning to help us deal with our target student or teacher population. We invite you to participate in this discussion by writing to me or to the editor of Noticias.[1] We will publish as many of your articles or letters on this and other topics that relate to the mission and goals of TODOS as we can.

(*Leiva, continued on page 5*)

(*Leiva, continued*)

## *A teacher makes a difference: High Expectations*

Recently I heard on NPR, National Public Radio, an interview with Tom Miller, editor of the book *How I Learned English: 55 Accomplished Latinos Recall Lessons in Language and Life*. [2] It was a "phone-in" program and I almost called to share my own experience. What would I say? What came to mind about my learning English? It was Mrs. Jones, my English teacher at Miami Senior High School when I first came to America -- the dreaded "queen" and department chair of the English Department… who did not give an inch.

I thought she was really mean and that she should cut me some slack; after all, I didn't speak English! But it seemed that she didn't know nor cared that I was trying but couldn't communicate. She taught me American Literature in the 11th grade; I should have had more sense, but I also signed up for Senior English Literature with her. Why did I do that and why does she reign in my memory even today when I think of teaching and learning? Because in a world where no one seemed to care, she cared enough to expect more from me, and from each one of her students.

To make a B in her class meant that you had to ace every test and assignment; but to make an A you had to do *extraordinary* projects, such as a book report on Edgar Allan Poe ***and*** recite his poem "The Bells." I have not forgotten "…the tintinnabulation of the bells." And I was scared to speak because I *knew* that my peers would make fun of me. She took me aside, with her stern face, and told me that I had to do the same thing as all others. No reprieve. Yes, she believed I could, and she made me try harder. Only once I saw her smile: she looked at me after a particularly difficult oral report, nodded and winked … she cared!

I have never forgotten Mrs. Jones yet I never went back to MHS to tell her how much she meant to me and how much her confidence in me inspired me to try harder. She inspired me to do more, to be better, and to believe in myself. By setting the bar high for all of us, she made us reach higher.

I had several other teachers subsequently who had a significant impact in my life, both personal and educational. It was because of such experiences that I decided to become a teacher and emulate them. In future articles I will write further about the great influence we have on our students.

We know that a teacher makes a difference. As you read this anecdote, think of your students as well as your own school experiences and how expectations for success and achievement make a difference. We look forward to hearing *your stories.*

[1] *The editors of Noticias invite you to send in your own article, email, or letters on issues related to teaching and learning as they relate to our mission, goals and target population. Send to:*

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[2] Miller, Tom (Ed.) (2007). *How I learned English: 55 accomplished Latinos recall lessons in language and life*. Washington, DC: National Geographic Books.

## TODOS at the Inter-Americas Committee of Mathematics Education

By Cindy Chapman and Rick Scott

At the conference of the Inter-Americas Committee on Mathematics Education in Querétaro, Mexico in July, 2007, Rick Scott and I did an interactive presentation on TODOS-Mathematics for All. We translated into Spanish most of the information about TODOS from the TODOS website and created a presentation. We asked the audience the questions listed below and report some of the participants' responses. The participants were generous in their willingness to discuss these issues with us.

**What should the U.S. teachers know about the immigrant students from Latin America?**

- *There isn't as much flexibility in Mexico for students to explore; there' s more discipline in the classes. When students arrive in the U.S. they may seem more regimented, less willing to explore. Students can't always pay attention in classes with exploration going on.*
- *Sometimes teachers in the U.S. think that Mexican students don't want to work.*
- *Don't put students who don't speak English in remedial classes!*

**What should they know about how math is taught in Latin America?**

- *Mexico uses different models for fractions than the U.S. uses, so fractions may be difficult for them.*
- *U.S. teachers need to find out what students know when they arrive. It's not so important to know how they're taught in Mexico.*

(*Chapman and Scott., continued on page 6*)

(*Chapman and Scott, continued*)

- *The Mexican states have different ways of teaching math.*

**What should the U.S. teachers know about math programs in Latin America?**

- *In the U.S., teachers don't seem to know much about the algorithms and processes used in other countries.*
- *There may be some difficulties with measurement/metric system versus the English system used in the U.S.*
- *A student was in the U.S. for 6 years. His math level seemed low when he returned to Mexico. He didn't have [a strong] sense of number. Number sense should be taught in early grades.*
- *Mexican students work for grades. They aren't necessarily motivated by other things as much.*

**If you could say just one thing to the teachers of the immigrants, what would it be?**

- *In Mexico and Central America there is more poverty [than in the U.S.].*
- *The U.S. teachers should learn Spanish.*
- *One teacher spoke of a child who attended school in Washington D.C. who received lots of special help the first 4 months. He then did very well mainstreamed into a regular class.*
- *The most important thing is for teachers themselves to learn about their students.*
- *Keep in mind that all students are different.*
- *It may be helpful to use more technology with these students such as graphing calculators and computers.*
- *Culture is important, technology is important.*
- *Students need problem/working/thinking vocabulary.*
- *Teachers need to learn to listen to their students. The relationships between teachers and students are important. Teachers need to understand that children aren't broken, they're very intelligent; they just don't speak English.*
- *Teachers should learn from each other and students should be allowed to learn from each other.*
- *As teachers we know our students. We know what they can do. We must respect what they can develop.*

A participant from Fundación Polar of Venezuela presented us with a book called Matemática Para Todos which was created by this foundation to show how math can be integrated with eight areas of study: agriculture, ecology, science, culture, economy, education and community development, history of Venezuela, and health and social well-being.

This poem was given to us by a Kindergarten teacher, developed in his class:

*No importa la raza*
*No importa el color*
*Los niños del mundo*
*Queremos amor*

*It doesn't matter the race*
*It doesn't matter the color*
*The children of the world*
*We all want love*

*Cindy Chapman and Rick Scott are co-international representatives of the TODOS Outreach Committee.*

# Communicating Mathematically: English Language Learners in the Mathematics Classroom

By Debra Coggins, Drew Kravin, Grace Dávila Coates, and Maria Dreux Carroll

"The ability to read, write, listen, think, and communicate about problems will develop and deepen students' understanding of mathematics." The Communication Standard: *Principles and Standards for School Mathematics*, NCTM 2000.

One essential aspect of *participation* in a high-level mathematics lesson is communication through written and oral language, including requirements for students to explain their mathematical thinking. The Communication Standard from the *Principles and Standards for School Mathematics* (NCTM, 2000) states that instructional programs from PreK-Grade 12 should enable students to organize and consolidate their mathematical thinking through communication; communicate their mathematical thinking coherently and clearly to peers, teachers, and others; analyze the mathematical thinking and strategies of others; and use the language of mathematics to analyze and express mathematical ideas precisely.

These recommendations have profound implications for the pedagogical strategies used by teachers of English language learners as well as for the achievement of all their students. These multiple abilities and higher expectations of mathematics learning present a particular difficulty for second language learners who are taught by traditional methods that depend on considerable teacher talk and relatively passive student involvement. *It is evident that use of language is essential for mathematics learning,*

(*Coggins, et al., continued on page 7*)

(*Coggins, et al., continued*)

*and mathematical activities provide opportunities to extend language skills.*

The authors of *English Language Learners in the Mathematics Classroom* joined together to address the critical issue of the level of mathematics learning by the growing numbers of English learners in American classrooms. Based on experience as professional development designers and providers, as college instructors, as researchers and writers, and as classroom teachers, we knew that the responsibility to seek and implement strategies for ensuring each student's development of communication skills and mathematical ideas ultimately falls upon the classroom teacher.

A major purpose of writing the book was to provide teachers with a context for focused conversations about expectations and possibilities for all learners. The accessible writing style and examples used, along with specific information and guidance related to several practical teaching strategies and a lesson map, are intended to spark reflections on current teaching practices. The hope is to inspire teachers to purposefully adopt effective strategies for teaching mathematics. *We believe that the recommended strategies are more than just good teaching practices, they are essential to the education of ELs.* We envision the use of our book in pre-service courses, in collaborative inquiry teams, and as a vehicle for school-wide or grade level implementation of effective strategies for teaching English learners.

Each chapter includes several components: mathematics teaching examples, each focused on a specific mathematics problem; a discussion of the use of the chapter's focus strategy in the teaching example; an overview of the research or theoretical basis for each chapter topic; specific teaching tips; further discussion of the focus strategy, and practice/discussion questions.

An extensive lesson-planning map is provided not as a template, but as a tool for teachers to think about the myriad of planning aspects that are part of an excellent lesson.

Samples of the chapter components are included in relation to the seven chapters listed below. For the sake of coherence, examples related to communication and language, have been selected.

**Developing Conversational Language: Help English Learners Talk-to-Learn During Mathematics Lessons** – Teaching Tips –Tips include suggestions to include brief Think-Pair-Share sessions on focused discussion topics and suggestions of sentence starters that can expand ELs' participation in discussions.

**Developing Academic Language: Develop Mathematics Concepts and Vocabulary for English Learners** – Discussion of the lesson vignette–The discussion of this lesson on comparative relationships emphasizes the need to provide a positive environment replete with opportunities to use academic language: The questions, verbal and physical models, diagrams, "talk to your neighbor" directions, and partner games all lead to an increased likelihood that students will have frequent meaningful encounters with the mathematics vocabulary.

**Scaffolding: Give Support for Both Mathematics and Language Learning** – Theoretical basis for the strategy – "Another [scaffolding] technique, is to provide challenging tasks, with collaborative support, including considerable social interaction" (National Research Council, 2001).

**The Role of Concrete Materials – Utilize Objects to Develop Mathematical Understanding for English Learners** – Research. While tactile and visual learning are significant meaning-centered components of instruction, benefits include not only increased access to ideas, but also multiple ways of thinking and communicating about the ideas.

**Visual Learning: Provide Mathematical and Organizational Representations as a Regular Component of Instruction Focused** – Discussion of the Topic– Focus questions, such as "What are graphic organizers, advance organizers, and diagrams, and why are they important?" are included. Each of these visual tools is defined, discussed, and examples are given. For example, "Graphic organizers are visual structures that make it possible to organize words, ideas, information and so on to further learning goals such as understanding, communicating, and remembering."

**Questioning Strategies**: **Ask Questions to Foster Students' Learning of Mathematics and English** – Mathematics teaching example – The lesson vignette about Snail Races, a probability game, includes many questions from the teacher, such as "Help me label our bar graph. How can we use this chart to find out which snail won the most in our class?…How did I choose the numbers [to use to label this tally chart]? How should we use this chart?" The questions are identified as to type of question, also.

**Comprehensible Input: Combine Many Strategies to Develop Mathematics Concepts Through Clear and Effective Instruction** – Practice and Discussion Questions - Question 1. Think about teaching a small group of

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(*Coggins, et al., continued*)

intermediate-level English learners the concept of perimeter. What would you say and how would you create access to your explanation? What would the students see? How would you assess students' learning?

Our book is intended to serve as a resource to our colleagues who work diligently to further the goals of mathematics for ALL. It is intended to show the high level of mathematical learning and increased use of language that result when specific and purposeful planning occurs in designing mathematics and ELD lessons. These strategies and components are designed to promote communication, mathematical understanding, increased skill development, and confidence for EL students.

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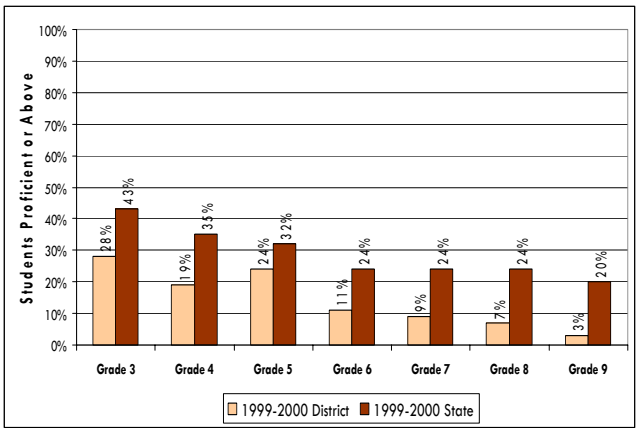
# Pointing the Right Direction: The Gadsden Mathematics Initiative

By Cathy Kinzer

New Mexico is a State that has many challenges in mathematics teaching and learning. The achievement gap based on standardized tests is a complex issue and it has often been easy to blame the students for the problem. For many years, the Gadsden Independent School district lagged behind the rest of the State in student achievement scores. This southern NM district borders Mexico and has about 15,000 students with about 40% in bilingual education programs. Beginning in 1999, Kinzer, Wiburg, and Guzman, Mathematics Educators from New Mexico State University worked in collaboration with the Gadsden Independent School District (GISD) Associate Superintendent, Yvonne Lozano, and her staff to develop a proposal for a Local Systemic Change Initiative, the *Gadsden Mathematics Initiative* (GMI). The GMI was a partnership designed to improve teachers' knowledge and skills in teaching mathematics using standards based resources, specifically: *Investigations in Number, Data and Space* and *Connected Mathematics Program*.

The GMI partnership between New Mexico State University and the GISD was remarkably successful in improving student achievement. This restructuring effort for students in grades K-8 in a low-income (100% free and reduced lunch) district with 60% English Language Learners (ELLs) and 94% Hispanic students resulted in closing the achievement gap, and in some cases surpassing state averages on the New Mexico Standards Based Assessment. Figure 1 represents student achievement scores at the beginning of the GMI project.

**Figure 1: 1999-2000 Mean Achievement Proficiency Scores for GISD Students as Compared to the State**

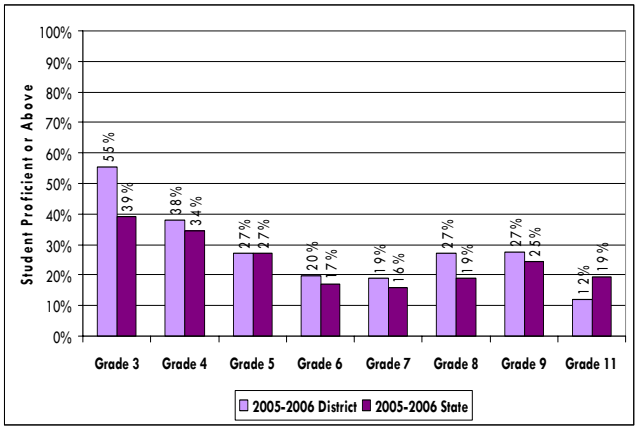



(*Kinzer, continued on page 9*)

(*Kinzer, continued*)

Figure 2 shows the proficiency levels of students in the district at the end of the five-year program. In addition, there is a noticeable drop in mean scores at 11th grade. The GMI was aimed at K-8 students and the effects seem to be maintained in grade nine but drop off as students move into high school. Presently, the GMI is fully sustainable by the district, which is using operational funds to improve student achievement by continuing to have a math specialist at each school to support the mathematics professional development.

**Figure 2: 2005-2006 Achievement Proficiency**




**Scores for GISD Students as Compared to the State**

Of special interest is the effect of the program on subgroups, especially English Language Learners (ELLs), who are now scoring above all ELLs in the state (See Table I).

**Table I: Percent of Students Proficient or Above (2005-2006) New Mexico Standards Based Assessments**

| | Grade 3 | | Grade 8 | |
|---|---|---|---|---|
| | **GISD** | **STATE** | **GISD** | **STATE** |
| **All Students** | **56%** | **44%** | **28%** | **26%** |
| **Hispanic Students** | **55%** | **39%** | **27%** | **19%** |
| **English Language Learners** | **57%** | **33%** | **21%** | **8%** |
| **Economically Disadvantaged** | **56%** | **36%** | **28%** | **14%** |
| **Students With Disabilities** | **27%** | **20%** | **4%** | **3%** |

A Student Outcomes Study was begun in 2003 to look for the effect of the GMI on student achievement. The final study showed that the professional development, level of implementation of the PD in the classroom, and teacher's collaborative work using modified lesson study all had a significant positive effect on student achievement. A mixed effects statistical model was used to analyze the data. Analysis further showed that the variance decreased between students, which resulted in higher achievement for all students. There are several ways to increase achievement and one of them is to lower variance bringing the lower students up closer to higher scoring students. An aligned curriculum and quality collaborative teaching may have produced this lowering of variance. The study also found changes in classroom instructional behaviors, which included increased use of teacher questioning, more problem-modeling, increased student engagement and increased classroom discourse (Wiburg, et al., 2007).

The GMI was successful in closing the achievement gap for Hispanic students in a 94% Hispanic district. As the national demographics of our student population becomes increasingly diverse, it is imperative that educators address the achievement gap and make it possible to increase the quantity, quality and diversity of students capable of studying in STEM fields and eventually entering the national STEM workforce. In fact, in an interview with engineers for an NSF project (Bridges Project, 2002) when asked about what students needed to know to enter engineering in university, consistently, the engineers suggested that an understanding of mathematics and especially mathematical reasoning was an essential component to the study of every STEM discipline. It is a lack of mathematical knowledge that keeps children from studying further in the STEM fields (Moses & Cobb, 2002).

A number of publications and reports ("Waiting for Sputnik"- Center for Strategic and International Studies, "Rising above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future" - National Governors' Association as well as the developing American Competitiveness Initiative) call for urgent action to improve the preparation of our nation's youth to work in STEM fields. One of the major findings of the GMI is that the problem does not lie with the children, their ethnicity or their income level, but with their lack of access to a system that provides all students with the opportunities to learn a rich and challenging mathematics curriculum. The GMI demonstrated what was first discovered in the effective schools research (McInerney, Dowson, & Van Etten, 2006), that schools can have a significantly positive effect on student learning, despite the fact that students are economically disadvantaged, have learning needs in terms of language and need to become part of an academic culture.

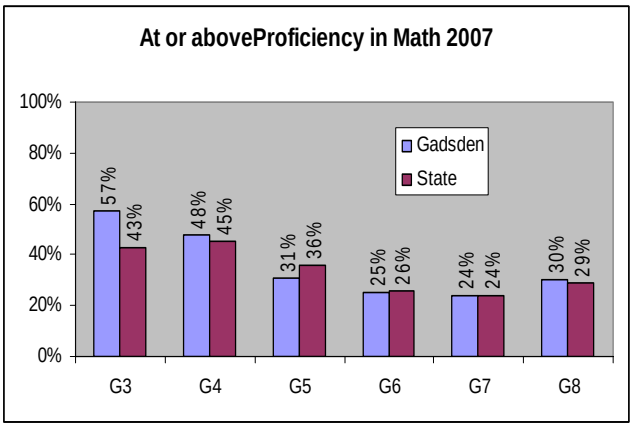
We are dedicated to improving mathematics education for our students; but this is a beginning... a commitment for quality

(*Kinzer, continued on page 10*)

(*Kinzer, continued*)

mathematics learning for all students. For example, Anthony Elementary School in GISD had about 70% of the ELL students' proficient on the 2005 NM Standards based assessment. Other GISD schools are making significant improvements. Figure 3 shows the 2007 results of the NM criterion referenced test.

**Figure 3 – 2006-2007 Achievement Proficiency Scores for GISD Students as Compared to the State**




Fifty percent of the value of the NM assessment comes from open-ended problem solving response items. The New Mexico Mathematics Standards and the Standards Based Assessment are ranked highly in studies by the Fordham Institute. The College of Engineering at New Mexico State University reports that Gadsden is the primary source for recruiting promising engineering students. A District that was at the bottom of State test scores is now leading the way.

One of the powerful messages of this initiative is that there is nothing wrong with the students and they must be provided with continuous access to rich mathematics learning opportunities. At the same time, it needs to be recognized that this is an ongoing effort that requires everyone from the superintendent to the instructional assistants to engage all children in mathematics that is challenging and meaningful to them.

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Cathy Kinzer is a mathematics educator at New Mexico State University. She is a member of TODOS and chair for the TODOS Schools. Her interests include preservice teacher education, English Language Learners in mathematics, and research on effective mathematics teaching and learning in school systems.

## New Web Services for Members

By Bob McDonald

TODOS is moving to a new service for members. The move to the service should be completed in November. With the new service, memberships and renewals will be able to be completed online. Members will also be able to update their mailing, work and email addresses. TODOS will once again be able to provide the list-serv in a weekly Digest format for members. Members will also be able to manage their subscription to the TODOS list-servs. Another benefit is that the TODOS elections will be online, leading to greater participation to choosing the leadership for your organization.

The member directory will be accessible online. Only members will have access to this feature, which will include the following: name, city, state, email address, job title, place of employment and grade level. Members who do not want this information made available to others in the TODOS family, will be able to indicate this within their record on the system.

We are excited about this move, which should greatly improve our ability to service the needs and requests of our membership. More detailed information, including your username and password for the members area of our website, will be sent to you this fall via snail mail and email.

Bob McDonald works with the membership committee for TODOS.

## "On Top of a Fraction"

By Larry Lesser

For those that work with younger audiences, I share this song about fractions that includes connections to Spanish: lyric © 2004, 2006 Larry Lesser; may be sung to the tune of "On Top of Old Smokey"

On top of a fraction
is the numerator--
It is the number
of pieces you store.
But we call the bottom
denominator--
It is the kind of
each piece, señor.

Like denomination
of money or faith,
Like thirds or sevenths
or halves or eighths.
So denominators
can be explained
Because in Spanish,
*nombre* means name!

While on top of a fraction,
we enumerate!
That means to count up
those of the same trait.
& when we add fractions,
make bottoms the same.
Add apples to apples;
add eighths to eighths.

Now think about music –
the time signature
Is really a fraction –
you can be sure
That fraction for this song
is three-quarter time –
So in each measure,
3 quarter-notes we find!

A TODOS member since 2004, UTEP associate professor Larry Lesser has represented TODOS or given TODOS-strand talks at CAMT, NCSM, and the 1st Conference on Math Education and Social Justice. His homepage includes resources for making mathematics more interesting, meaningful, and accessible. (**www.math.utep.edu/Faculty/lesser/**)

*The Presidential Committee: Miriam Leiva, José Franco, and Nora Ramirez at the Annual Board meeting in Columbus Ohio:*

## Elections for Vice-President and Member-at-Large

by Ed Dickey, Chair
TODOS Nominations and Elections Committee

The Nominations and Elections Committee is CALLING for NOMINEES for the office of Vice-President and a Member-at-Large of TODOS. Please survey potential nominees for approval and acceptance of nomination. Self-nominations are also acceptable. Descriptions of these two positions are provided below. Send the two-page nomination form by e-mail to **elections@todos-math.org** or by fax to 803-777-3193 no later than November 30, 2007. Nomination forms can be retrieved at **http://www.todos-math.org/elections.html**

Qualifications: Candidates must be members in good standing of TODOS for at least one year before being placed in nomination. Candidate should have held or should currently be holding a position of mathematics education leadership at either the local, state, or national level, and they should support the TODOS mission.

**Candidates for the office of Vice-President** should be committed to holding the position for two years, commencing April 2008.
**Candidates for the office of Member-at-Large** should be committed to holding the position for the entire three-year term, commencing April 2008.

MEMBERSHIP
Membership dues for
TODOS: Mathematics for ALL
are $25 per year, or 3 years for $70.
Information on Institutional and
District Membership is available on
our websitewww.todos-math.org

# NOTICIAS de TODOS

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**IN THIS ISSUE**:



*The mission of TODOS: Mathematics for ALL is to advocate for an equitable and high quality mathematics education for all students, in particular Latino/Hispanic students, by increasing the equity awareness of educators and their ability to foster students' proficiency in rigorous and coherent mathematics.*