

# New Mexico Quality Mathematics Education Model

The New Mexico Quality Mathematics Education Model (QMEM) was developed in response to recommendations at the New Mexico Town Hall on Mathematics and Science Education. The following are guidelines for developing, implementing and sustaining a local QMEM to improve the teaching and learning of mathematics for all students.

## Curriculum

***Adopt and implement a mathematics curriculum (a plan for what and how students learn) that is aligned to New Mexico Content and Process Standards, and Standards-Based Assessment.***

The curriculum needs to be mathematically rich providing students with opportunities to learn important grade level concepts and procedures with a deep understanding through the Process Standards (problem-solving, representation, reasoning and proof, communication, connections)

- Establish a district curriculum (what and how students learn) that is aligned to New Mexico Math Content and Process Standards
- Adopt standards-based resources that are field-tested and support the New Mexico Math Content and Process Standards
- Provide Professional Development opportunities for teachers to support implementation of standards-based teaching and learning
- Use district, school, and classroom data as tools to guide implementation of adopted curriculum

## Professional Development

***Educators must be active life-long learners in the pursuit of improving the teaching and learning of mathematics.***

The goal of professional development is to support teachers in that pursuit, thereby improving student learning in mathematics. Professional development is not a one-time event. It is ongoing and multi-faceted. Therefore all professional development programs must:

- Establish collaborative professional learning communities for all teachers
- Develop and use teacher leaders to facilitate the collaborative learning communities
- Align with the *New Mexico Standards* and selected curriculum materials
- Become embedded in the daily work of all teachers
- Include high quality, meaningful content (learning theory, assessment, leadership training, math content and pedagogy)
- Be evaluated in terms of its impact on student learning

## Leadership

***Leadership is the guidance and direction of instructional improvement.***

Strong, systemic leadership is essential for the implementation of a Quality Mathematics Education Model (QMEM). District leaders, including superintendents, principals and teacher leaders, need to:

- Establish structures for regular teacher collaboration during the school day
- Design and monitor an implementation plan in which all teachers must participate
- Ensure that all teachers and leaders receive ongoing, quality mathematics professional development
- Use data management structures to monitor implementation of the QMEM and ensure that data collection and analysis is part of the culture of the system
- Ensure that the system provides all students access to all the Standards
- Promote ongoing communication with all stakeholders (community, parents, staff, and students) about the vision and progress of the QMEM

(Comments on the above document can be sent by June 15 to Rick Scott: [pscott@nmsu.edu](mailto:pscott@nmsu.edu).)

**PROPOSED TITLE OF PRESENTATION OR DISPLAY**

The Gadsden Mathematics Initiative: Planning, Implementing, and Sustaining a Model for Change

**PROGRAM BOOK SYNOPSIS/DESCRIPTION**

In five years, the Gadsden Independent School District went from having the lowest student test scores in mathematics in the state, to being a model for continuous improvement throughout the state. A video and PowerPoint presentation outline the model used to facilitate the change process used in a high poverty, predominately Hispanic minority district in southern New Mexico. Results and implications of the initiative will be shared and discussed.

**OUTLINE THE PRESENTATION APPROACH IN 75 WORDS OR LESS. WHAT WILL THE AUDIENCE EXPERIENCE?**

Participants will view a narrated video highlighting the unique characteristics of the southern New Mexico region where the Gadsden Independent School District is situated: culture, economy, geography, and people. A PowerPoint presentation will outline how a top-down change model can be successfully initiated, implemented, and sustained through bottom-up support that includes aligned resources, curriculum, and professional development. Time is allotted for questions and answers.

**PLEASE IDENTIFY THE ANNUAL/PROJECTED BUDGET FOR THE PROCESS AND ITS FUNDING SOURCE, IN 200 WORDS OR LESS.**

Gadsden Independent School District in June, 2000, was awarded a \$5,000,000 grant from the National Science Foundation for a local systemic change initiative in mathematics. The money was distributed over the five-year period from June 2000 through May, 2006. The grant required the district provide matching cost share funds each year. The cost share total was \$3,591,997 over the five year period. Additionally, the district used Title I and II funds to pay for campus supplies and materials, personnel, and some professional development. In 2005, the district was awarded, a \$200,000 supplementary grant to provide additional professional development specifically for new teachers and special education teachers. To sustain the initiative, the district has budgeted a little over \$1,100,000 to fund salaries for campus and district support personnel in 2006-2007. The operational budget for replacement supplies and materials for 2006-2007 is approximately \$50,000 for 17 campuses. District money is also allocated for textbook replacements and a new mathematics textbook adoption process in 2007.

**IN 200 WORDS OR LESS, PLEASE ARTICULATE THE ROLES OF THE SCHOOL BOARD IN THIS PROCESS-WHAT DID THE SCHOOL BOARD CONTRIBUTE, AND HOW WERE THEY INVOLVED?**

In 1999-2000, the Gadsden Independent School District school board directed the superintendent to initiate a plan for mathematics improvement because the district's students each year continued to have the lowest achievement scores in the state of New Mexico. The school board approved the plan for change outlined in the application for the National Science Foundation grant. Once the grant was obtained, the school board included a specific goal addressing the implementation of the Gadsden Mathematics Initiative as part of the school board goals and campus goals for student success. During the past five years, the Gadsden school board was kept informed of student progress toward meeting annual yearly progress goals in mathematics. The

board continued to be committed to supporting the initiative even during a court directed recall election when four of the five school board members were replaced in 2005-2006.

**IN 200 WORDS OR LESS, PLEASE SHARE EVIDENCE OF SUCCESS WITH THIS PROGRAM, PROJECT, OR INITIATIVE (INCLUDE ANY SPECIFIC IMPACT OR RESULTS THAT SUPPORT THE PROGRAM OR PROCESS).**

In 1999-2000 Gadsden Independent School District only 19% of elementary students and 7% of middle school students were considered proficient in mathematics. Five years after implementing a local systemic change model, Gadsden students in Grades 3-8 are approaching the state average for achievement in mathematics. In 2004-2005, all districts students Grades 3-8 meet AYP for mathematics including the subgroups: Hispanic, English Language Learners, Free and Reduced Lunch Program. Eleven elementary schools met AYP in the special education subgroup in mathematics; three did not. In November 2005, the state department scheduled the First Town Hall Meeting addressing the future of mathematics and science education in New Mexico. Dr. Rick Scott, New Mexico State University, authored a background report about the current state of math and science education in the state. Overall, the report was dismal about the history of math and science education in New Mexico. Looking at data over a 10 year period, it was noted that numerous programs in the state were awarded grants of 1 million dollars plus. However, it was noted in the report that the only school district showing any significant growth in students' mathematics achievement over time was the Gadsden Independent School District. As a response to the Town Hall Meeting, the Gadsden model was used as a prototype to design the New Mexico Quality Mathematics Education Model for the state.

**IN 500 WORDS OR LESS, PLEASE PROVIDE A BRIEF OVERVIEW OF YOUR PROGRAM OR PROCESS (INCLUDE HOW/WHY THE PROGRAM/PROCESS WAS STARTED, STEPS FOR DEVELOPMENT, AND LESSONS LEARNED).**

Is it possible to have high mathematics performance in a low income, high minority school district? In response to that question, the Gadsden Independent School District in 1999, applied for a National Science Foundation Grant to change the way mathematics was taught in the district. The data collected for the grant proposal showed district students, Grades 3-8, had not shown any significant improvement in mathematics over the previous five-year period. The proposal to the National Science Foundation outlined an action plan that would require: 1) implementing a systematic change in the delivery of mathematics curriculum, 2) transforming the instructional practices in mathematics through teacher professional development, 3) increasing student achievement in mathematics K-8. The plan included a partnership with New Mexico State University to provide initial professional development. When the grant was awarded, the superintendent, with school board backing, directed the elementary and middle schools to implement the action plan. A new mathematics curriculum, aligned to state standards and benchmarks and approved by the National Science Foundation, was selected for teachers to implement. Teachers were provided an initial week-long summer professional development academy during the first year of the grant that addressed: constructivist classroom pedagogy, mathematics content, and instructional strategies consistent with the new curriculum. In addition to new textbooks, teachers were provided an array of manipulatives and materials that supported the new curriculum. Additional day long mathematics trainings were provided during the year on district professional development days. A district math process trainer (coach) and a university staff member provided campus and teacher support the first year. Elementary and

middle school principals participated in six half-day professional development sessions in order to support the initiative at the campus level. The second and third years of the grant, teachers participated in additional summer academies. Math mentors (full-time classroom teachers) were given additional training and acted as campus liaisons for mathematics. An additional district math process trainer was hired to increase support through campus grade level meetings. District-wide teacher and principal professional development was also continued during the second and third year. In the fourth/fifth year of the grant, the Math Mentor Program was discontinued and math process trainers were hired to provide full-time leadership at all of the elementary and middle school campuses. Two Instructional Specialists were hired to coordinate the campus and district mathematics efforts K-12. A supplemental grant was received in 2004 to address specific needs of special education and novice teachers. While a partnership with the university staff existed over the course of the grant, the district made a conscious effort to focus on long-range goals and sustainability of the initiative by developing the mathematics expertise of in-district personnel. A major reason for the success of the initiative is the willingness of the superintendent and the school board to provide unwavering support in terms of time, resources, personnel, and encouragement.