Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching

TEXAS REGIONAL COLLABORATIVES
Excellence
IN THE SERVICE OF SCIENCE AND MATHEMATICS TEACHERS

Dynamic Partnerships for 21st Century Science and Mathematics Education

2013-2014

Headquartered at the

Center for STEM Education
College of Education
The University of Texas at Austin

TEXAS REGIONAL COLLABORATIVES

BACKGROUND INFORMATION AND HISTORY

In 1991, tremendous science education reform activities were underway across Texas and the nation. Changes necessitated that teachers provide science instruction in fields for which they were not prepared. Dr. Kamil A. Jbeily, then at the Texas Education Agency, initiated a series of regional meetings across the state to explore ways to create support systems of professional development for Texas science teachers. The meetings included representatives from education service centers, colleges and universities, school districts, business and industry, and institutions of informal education. The goal was to create regional partnerships built on collaboration and cost-sharing that provided science teachers with relevant, sustained, and high-intensity professional development. These P-16 partnerships, with initial federal funding from the Dwight D. Eisenhower Science Professional Development Program developed into the statewide network that is now the Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching.

On March 2, 1996, with the reorganization of the Texas Education Agency, the statewide administrative office of the Texas Regional Collaboratives (TRC) was moved, under a TEA grant to the Science Education Center, now the Center for STEM Education at The University of Texas at Austin. The program has enjoyed support from a wide range of collaborators and funders including the U.S. Department of Education Eisenhower Grants Program, the Texas Education Agency, the National Science Foundation, and a number of corporate supporters including AT&T Foundation, Shell, The Cynthia and George Mitchell Foundation, El Paso Corporation, and others. In addition, over fifty business and community partners support activities of the Collaboratives at the regional level.

In March 2006, as per a historic $1.0 Million gift from Shell Oil Company, two Louisiana Regional Collaboratives prototypes modeled after the TRC, commenced their activities in the service of Louisiana science teachers. In July 2006, the TRC launched a new initiative supported by Math and Science Partnership funding through the Texas Education Agency to provide high quality professional development to mathematics teachers across Texas through a network of Mathematics Regional Collaboratives.

The long-range goals of the Regional Collaboratives are to continuously (1) enhance the quality of science and mathematics teaching in Texas through Professional Development Academies and inter-regional collaboration; (2) increase the number of qualified science and mathematics educators by building the leadership capacity of teachers to mentor and serve a larger number of teachers; and (3) improve accountability of the system by evaluating the impact of the professional development on teachers' knowledge and skills, their performance in the classroom, and on student achievement.

The Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching program has received commendations from the U.S. Department of Education, policy makers, state legislators, and business partners. The Program was inducted into the Texas Science Hall of Fame on January 17, 2000, and was recognized by the Governor, the Senate, and House of Representatives on January 16, 2001 for distinguished achievements and contributions to supporting education reform.

Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching

Who We Are

The Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching (TRC) is an award-winning statewide network of 58 P-16 partnerships (Regional Collaboratives) that provide sustained and high intensity professional development to P-12 teachers of science and mathematics across the state. Funded by the Texas Education Agency and other organizations and foundations, this infrastructure of over 58 institutions of higher education collaborating with the Education Service Centers, school districts, and business partners, has a 22-year track record of designing and implementing exemplary professional development using research-based instructional models, materials, and best practices.

Our Mission

To provide Texas science and mathematics teachers with support systems of scientifically researched, sustained, and high intensity professional development and mentoring to assist them in the successful implementation of the Texas Essential Knowledge and Skills (TEKS). TRC programs equip teachers with the knowledge and skills to engage students in meaningful science and mathematics learning experiences. Activities are designed to improve students' scientific, mathematical and technological literacy, and inspire them to pursue science and engineering related careers.

Achievements

• Over three million students across Texas have benefited from the improved instruction and performance of participating teachers. The program has developed the knowledge, skills, and leadership capacity of approximately 35,000 teachers of science and mathematics through sustained and high intensity professional development. Many of these teachers serve as Science Teacher Mentors (STMs) and Mathematics Teacher Mentors (MTMs), and share their experiences with other teachers through mentoring, peer coaching, technical assistance, and workshops at the campus, district, and regional levels. Science and mathematics teachers in almost all of the state's 254 counties have been the beneficiaries of this extensive statewide network.

• Transformed the culture of professional development into one that commits to a high quality, sustained, and results-driven support system that has a positive impact on teacher performance and student achievement.

• Received commendation from U.S. Department of Education, National Science Foundation, policy makers, legislators, and business partners; inducted into the Texas Science Hall of Fame, and recognized by the Governor, the Senate and House of Representatives for distinguished achievements and contributions to supporting excellence in science education.

Values

- We **serve** the teachers and students of Texas.
- We **treasure** our people.
- We **operate** with integrity.
- We **reward** our partners.
- We **contribute** to systemic reform and to the community.

Texas Regional Collaboratives

As part of its charge to build leadership capacity and develop the knowledge and skills of science and mathematics teachers and educators, the TRC continues to offer Professional Development Academies (PDAs) in content areas and at grade levels consistent with state priorities, teacher needs, and student achievement data.

The content and instructional strategies acquired during these PDAs are shared with teachers through Professional Development Programs (PDPs) designed and implemented by the local Regional Collaborative.

Science on the Road PDA

2013-2014 PROGRAM GOALS

Numerous large-scale studies have identified teacher quality, more than any other factor, as a key determinant of student success. Studies have consistently documented the important connection between a teacher's content knowledge, verbal ability, and student achievement.

Research suggests that in order to have a positive and lasting impact on classroom instruction and student learning, professional development should be sustained, intensive, and classroom-focused. The TRC is committed to assisting partnerships in providing high quality professional development in support of teachers' efforts to raise research-based student achievement. Successful programs generally include:

- Summer institutes coupled with follow-up training over a sustained period throughout the school year to support classroom implementation and schoolwide dissemination.
- Ongoing opportunities for enhanced professional development that improves teachers' subject matter knowledge and promotes strong teaching skills.
- Opportunities for teachers to build leadership capacity and collaborative skills through the development of professional learning communities in each Regional Collaborative.

The design of professional development at all levels of the TRC network centers on content knowledge, the principles of effective instruction and student learning, a commitment of time and resources for implementing professional development over an extended period of time, and the employment of professional development styles that engage teachers collaboratively as well as individually.

PROGRAM STRUCTURE

Teachers commit to participate in 100 hours of professional development during the program year to become Science Teacher Mentors (STM) or Mathematics Teacher Mentors (MTM). During this time, Teacher Mentors are expected to use what they have learned through these professional development experiences to provide mentoring, technical assistance, peer coaching and leadership to additional teachers of science or mathematics in their local campuses and districts. Teachers who receive this mentoring outreach are referred to as Cadre Members (CMs).

MENTORING

Mentors use their knowledge and understanding of teaching and learning to support Cadre Members in a variety of ways such as:

- Serving as instructional leaders for their campus or district, especially in small, rural district administrations that do not have science or mathematics curriculum specialists positions,
- Encouraging other teachers to benefit from the Regional Collaborative professional development activities, and
- Sharing research-based lessons and strategies with peers.

Cadre Members participate in the Regional Collaboratives by attending 12 to 24 hours of professional development. In some cases, these teachers attend workshops along with mentor teachers, and in other cases, they receive the training directly from the mentor teachers. This mentor-cadre relationship provides a venue for key ideas and strategies on science and mathematics teaching to be shared throughout the schools.

Professional Development Academies (PDAs)

Each Regional Collaborative designs its program based on the needs of teachers and students as reflected in surveys and state test data. Each Collaborative has an assessment plan in place that evaluates teachers' content knowledge growth, impact on instruction and student achievement as a result of their participation in the Professional Development Program.

The TRC offers a series of Professional Development Academies (PDAs) for Instructional Team Members (ITMs) to support Collaboratives in implementing research-based professional development with their teachers. TRC Professional Development Academies are grounded in research on effective strategies for improving students' learning. The TRC PDAs continue to have a secondary level focus to help teachers and students meet the challenges of the new End of Course state assessments administered at the high school level. In addition to a secondary focus, the TRC also supports elementary grade teachers for professional development which is vertically aligned with these content priorities.

PDAs for the Texas Regional Collaboratives are posted on the TRC website and updated on a regular basis. The PDA goals for math and science in the 2013-2014 year are detailed below:

Mathematics Goals

The 2013-14 PDAs for mathematics will focus on algebra, geometry and proportional reasoning. Mathematics PDAs prepare instructional teams to conduct rich professional development in which teachers experience the power of problem solving, intense work with numbers and operations, and plan instruction around children's approaches, rigorous mathematics, and meaningful assessment. ITMs will be able to support student success by increasing teachers' content and pedagogical knowledge.

Beginning in elementary school, students build algebraic reasoning as they learn about whole number operations and their properties. In the middle grades students use this foundation to think about equivalence and functional relationships. The PDAs provide opportunities to build basic conceptual understanding that later becomes the foundation for Algebraic Reasoning.

In addition, PDAs support Instructional Teams by providing experiences that help teachers integrate geometry, algebra and proportional concepts rather than treat them as stand alone topics. As a result of these PDAs, Instructional Teams help teachers learn instructional strategies for teaching geometry and proportional concepts, build an understanding of students' reasoning about proportion, and increase their own content knowledge about proportional reasoning.

Science Goals

Common themes in the TRC science professional development program for the 2013-2014 year are content knowledge and conceptual understanding of chemistry and physics, and effective strategies for physical science instruction. In collaboration with the Texas Education Agency, the TRC has identified TEKS that are particularly challenging for Texas middle school students. Consequently, PDAs have been developed to focus on these identified TEKS.

Particular attention is given to Middle School TEKS 8.5 A-E and 7.5 A addressing the big ideas of Matter and Energy, and TEKS 8.6 A-C and 6.8 A & C that address Force and Motion. Overall, Science PDAs in 2013-2014 promote TEKS-aligned instruction, deepen teachers' understanding of physical science, support teachers in meeting the suggested time engaged in hands-on activities, and increase teacher awareness of and proficiency in formative as well as summative assessment of student understanding.

Science PDAs will continue to equip instructional teams with the knowledge and skills needed to support teachers of science with relevant and TEKS-based professional development opportunities.

PROFESSIONAL DEVELOPMENT ACADEMIES/PROGRAMS

Professional Development Academies

Early Childhood - GLOBE PDA

Professional Development Academies (PDAs) serve professors of science and mathematics, instructional specialists, science and mathematics education professors, and master teachers.

PDAs enhance the participants' knowledge and skills necessary to develop, sustain and facilitate high quality professional development programs.

PDAs activities are aligned with state standards and priorities.

PDAs afford providers of professional development across the state opportunities to model life-long learning.

Professional Development Programs

Professional Development Programs (PDPs) at each Regional Collaborative provide a comprehensive set of research-based experiences for Science and Mathematics Teacher Mentors. Mentors are supported by their schools, districts, and the Regional Collaborative to serve other teachers in their districts.

The mentorship design is validated by research that confirms that the effectiveness of extended sustained professional development for teachers results in actual change in teacher content knowledge and improvement in students' understanding of subject matter content and applications.

Young Mathematicians at Work PDA

Responsibilities and Benefits

Teacher Responsibilities

STMs/MTMs are expected to:

- Complete 100 contact hours of professional development focused on improvements in science or mathematics content knowledge.
- Take a pre/post test of their content knowledge.
- Mentor other teachers referred to as Cadre Members (CMs), and share strategies, resources and materials with entire school.
- Keep school administration informed about the Regional Collaborative professional development activities and their impact on student achievement.

District Responsibilities

Campuses and/or districts are expected to:

- Provide STMs/MTMs with release time as agreed to in the teacher application to join the Regional Collaborative.
- Work with the Regional Collaborative to collect data about the impact of the TRC on student achievement (i.e. TAKS/STAAR scores, TMSDS measures).
- Support STMs/MTMs to provide mentoring and assistance for other district teachers (CMs).
- Use the TRC structure to scale up and maximize improvements in STEM teaching and learning.
- Provide facilities for Regional Collaborative training if necessary.

Biotechnology PDA

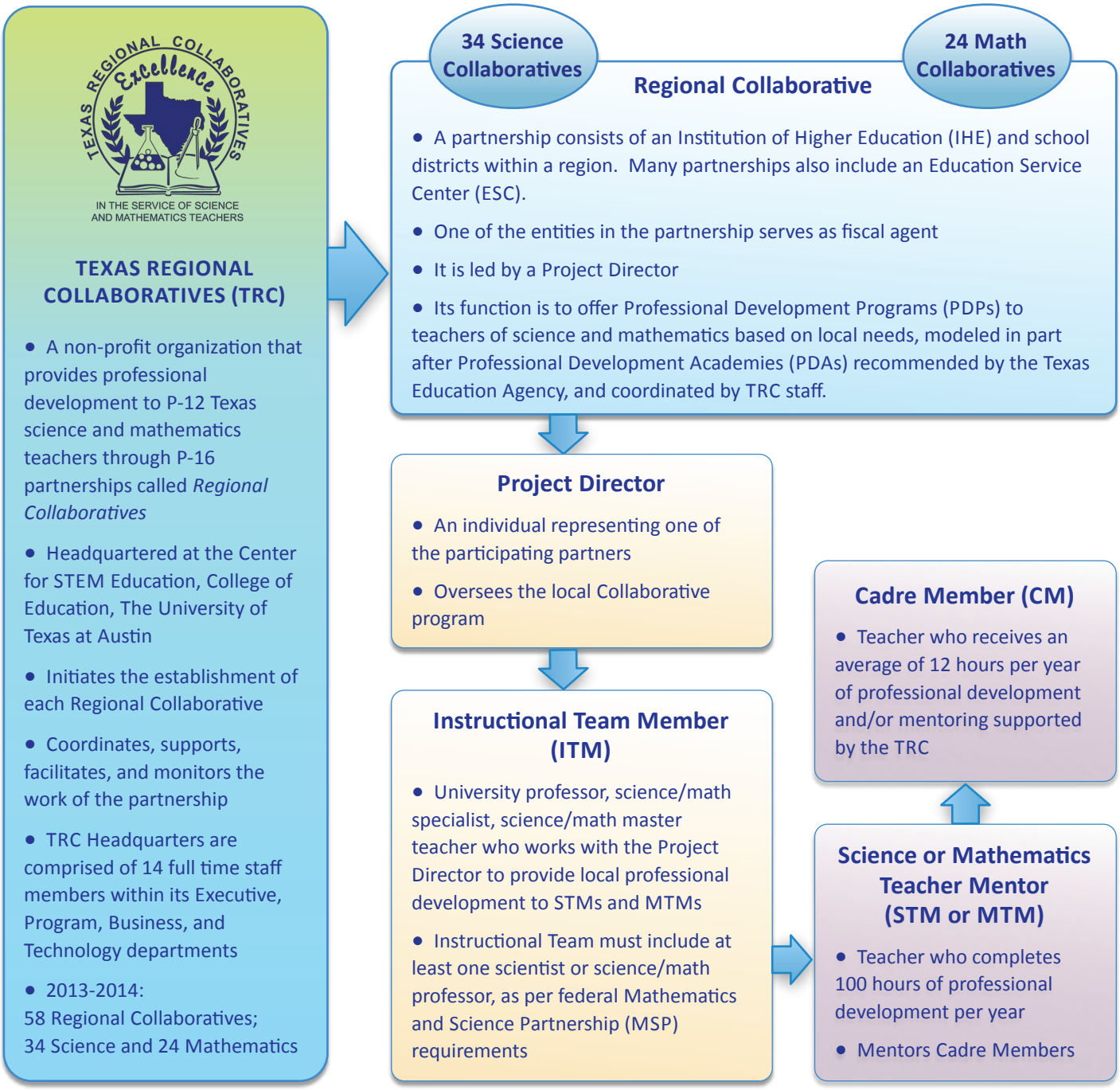
Teacher and District Benefits

Each Collaborative offers a variety of benefits that may vary depending on the program. The following is a sampling:

- Access to high quality research-based professional development at no cost to the teacher or school.
- Free instructional materials for classroom implementation of the professional development.
- Leadership opportunities to present at district, state, and national conferences and professional meetings.
- Networking with a group of professionals dedicated to honing their craft and achieving STEM education excellence.
- Building relationships with professors in Institutions of Higher Education.
- Stipends for summer or weekend attendance.
- Support for completion of graduate courses or degrees.

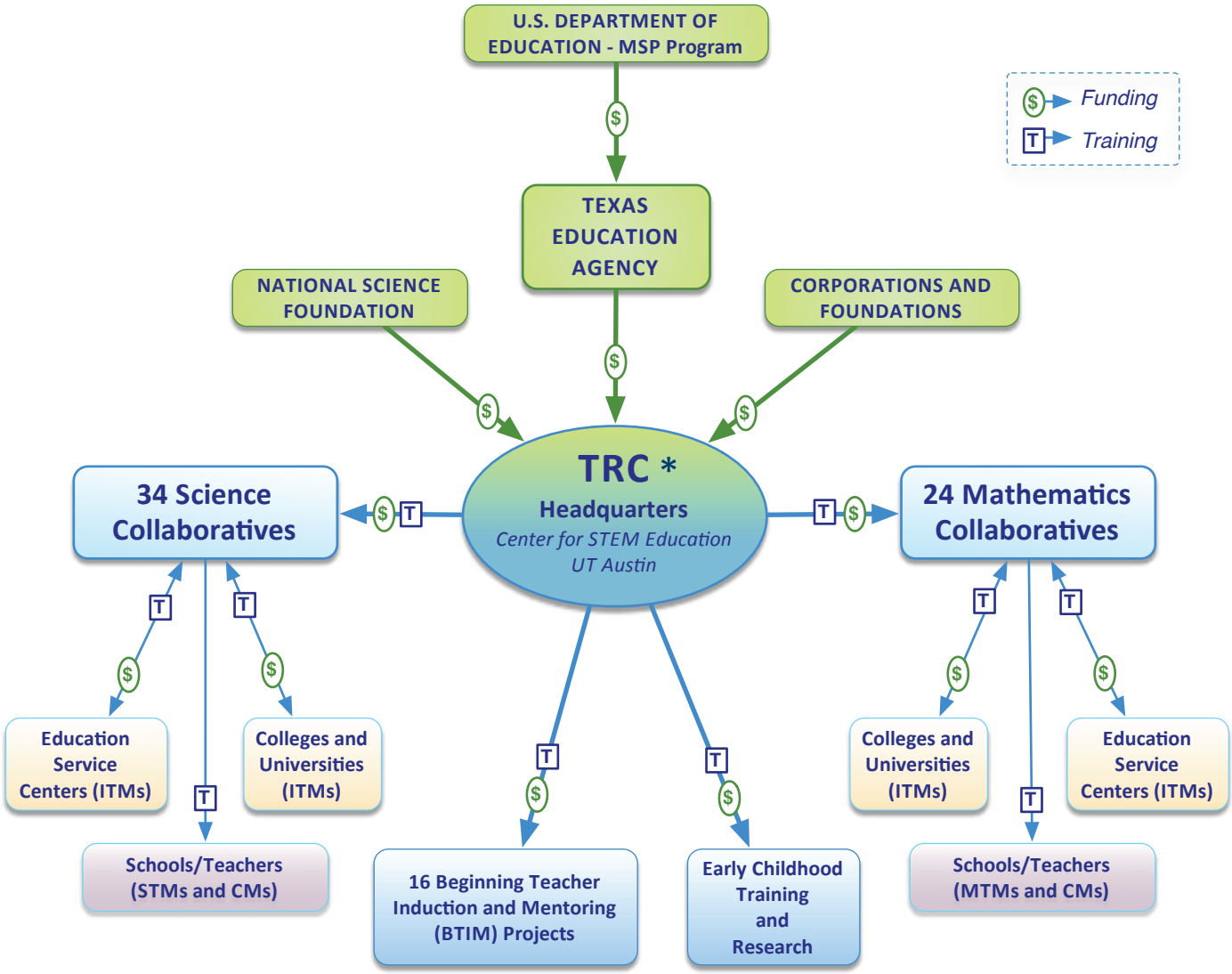
TRC Program Components

2013-2014



TRC Relationships and Flow of Funding

2013-2014



* An Advisory Board provides the TRC input, feedback, advice, and suggestions regarding current activities and future action plans. The Board includes TEA representatives, corporate partners, teachers, project directors, university and school administrators, professors, and community leaders.

HONORING THE TEACHERS

These regional events recognize and honor participating teachers; and engage administrators, policy makers, legislators, and business leaders in the program.

Through these events, the Regional Collaborative leaders thank business partners, celebrate the partnerships in the community, acknowledge support of administrators, and publicize the program through media outlets in the region.

Teacher Leaders receive certificates from The State of Texas House of Representatives

(l to r) **Dr. Brenda Weiser,** *Project Director*, UHCL/EIH Regional Science Collaborative; **Angela Ruggeri**, *Teacher*, Pasadena ISD, and **Senator Mike Jackson** at UHCL/EIH Regional Collaborative Honoring the Teachers

LaJuan Garrett, *Teacher*, Simms ISD, and **Representative Stephen J. Frost**, District 1, at TAMU Texarkana Regional Science Collaborative Honoring the Teachers

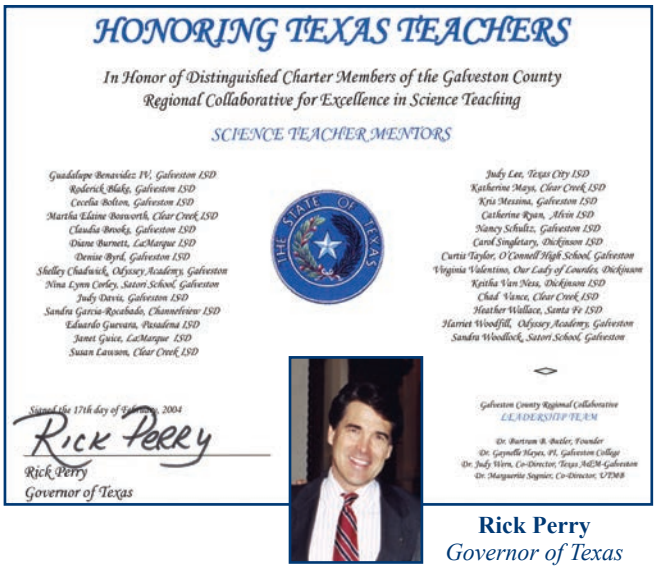
Celebrating the Partnerships

(l to r) **Dr. Joseph Meyinsse,** *Project Director*, Louisiana State University/Southern University Regional Collaborative; **Dr. James McCoy,** *Vice Provost*, Louisiana State University; **Dr. Ralph Slaughter**, *President*, Southern University System; **Dr. Brenda Nixon**, *Project Director*, Louisiana State University/Southern University Regional Collaborative; **The Honorable Ben Nevers**, *Chair, Senate Education Committee*, Louisiana State Senate; **Dr. Kamil A. Jbeily**; **Dr. Frazier Wilson**, *Manager, Social Investment*, Shell Oil Company; and **Dr. Mwalimu Shujaa**, *Executive Vice Chancellor & Provost*, Southern University-Baton Rouge

Senator Florence Shapiro and **Dr. Kamil Jbeily** at UNT Regional Science Collaborative Honoring the Teachers

Representative Alma Allen, District 131, and **Tracy Ward Whatley,** *Teacher,* Pasadena ISD, at UHCL/EIH Regional Science Collaborative Honoring the Teachers

Patricia Kehler-Moncur, *Teacher*, Houston ISD, and **Representative John Davis,** District 129, at UHCL/EIH Regional Science Collaborative Honoring the Teachers



Rick Perry
Governor of Texas

(l to r) **Bruce Connery,** *Vice President of Investor and Media Relations,* El Paso Corporation; **Dr. James Barufaldi,** *Principal Investigator,* TRC; **Dr. William Staples**, *President*, University of Houston-Clear Lake; **Dr. Carl Stockton,** *Provost*, UHCL; **Leticia Konigsberg,** *Educational Program Coordinator,* Corporate Foundation, El Paso Corporation; and **Dr. Jbeily** at the UHCL/EIH Regional Science Collaborative Honoring the Teachers

This statewide event brings together teachers, education and business leaders, policy makers, and legislators to celebrate and recognize the achievements of the Collaboratives. The meeting provides opportunities for interregional sharing of ideas, collaboration, and networking. Participants learn about state-of-the-art trends and recent developments in science, technology, engineering, and mathematics (STEM) education.

Keynote Speakers and Guests From Past Annual Meetings

"Teaching and mentoring are the backbone of P-16 education and we want to continue to recognize those teachers who are an inspiration and who are role models in their schools."

UT System Chancellor
Francisco G. Cigarroa, M.D.

"Thousands of Texas teachers have benefitted from this remarkable program. We need to replicate this for every other subject that's taught: what the Collaboratives accomplish makes our teachers strong, and Texas is very proud and grateful."

Texas Representative
Geanie Morrison

"It is a pleasure to be with those who excel. You are truly the future of Texas. Without this Collaborative and these partnerships, we could not position the State of Texas to meet the needs of our country in the future. We are eternally grateful to your commitment in education."

Texas Representative
Drew Darby

Eighteenth Annual Meeting

June 27, 2012

The Eighteenth Annual Meeting attendees were honored by a keynote address from the State Representative Rob Eissler, chairman of the Texas Legislature's Public Education Committee.

The Honorable Rob Eissler

"I would like to congratulate all of you who give so much to STEM education," said Eissler. "For those of you who are mentoring as well as teaching, I want to offer special thanks. I strongly support public education and believe that we must do whatever it takes to make sure that all students have an opportunity for academic success."

"Effective science and math education is essential for Texas to prosper and lead the way for the nation. If we don't lead in STEM areas, we fall behind as a state and as a nation in the international arena. The hard work you're doing in classrooms every day is securing prosperity for us all and helping our children be able to leave public schools with the option of whatever career path they choose."

State Representative Rob Eissler

Eighteenth Annual Meeting Showcase and Reception

The 2012 TRC Distinguished Service Award went to **Irene Pickhardt**, Statewide Science Coordinator at the Texas Education Agency.

Engaging Policy Makers, Business & Education Leaders

Distinguished Service Award Winners

2002

The Honorable Geanie Morrison
Texas House of Representatives

2006

Dr. James P. Barufaldi
Director, Center for Science and Mathematics Edu.
College of Education
The University of Texas at Austin

2009

Dr. Jesús Chávez
Superintendent
Round Rock ISD

2011

Stef Paramoure
Science Teacher

Nationally recognized education leaders speak on trends and systemic reform in STEM education. Teacher leaders and community partners are recognized and honored with distinguished teaching, mentoring, and service awards.

Fifteenth Annual Meeting

Kirk Watson
Senator
The Senate of Texas

Twelfth Annual Meeting

William C. Powers, Jr.
President
The University of Texas at Austin

Fourteenth Annual Meeting

The Honorable Donna Howard
State Representative, District 48
Texas House of Representatives

Eleventh Annual Meeting

John Hofmeister
Former President
Shell Oil Company

Ninth Annual Meeting

Sandy Kress
Former Senior Advisor
to President Bush on Education

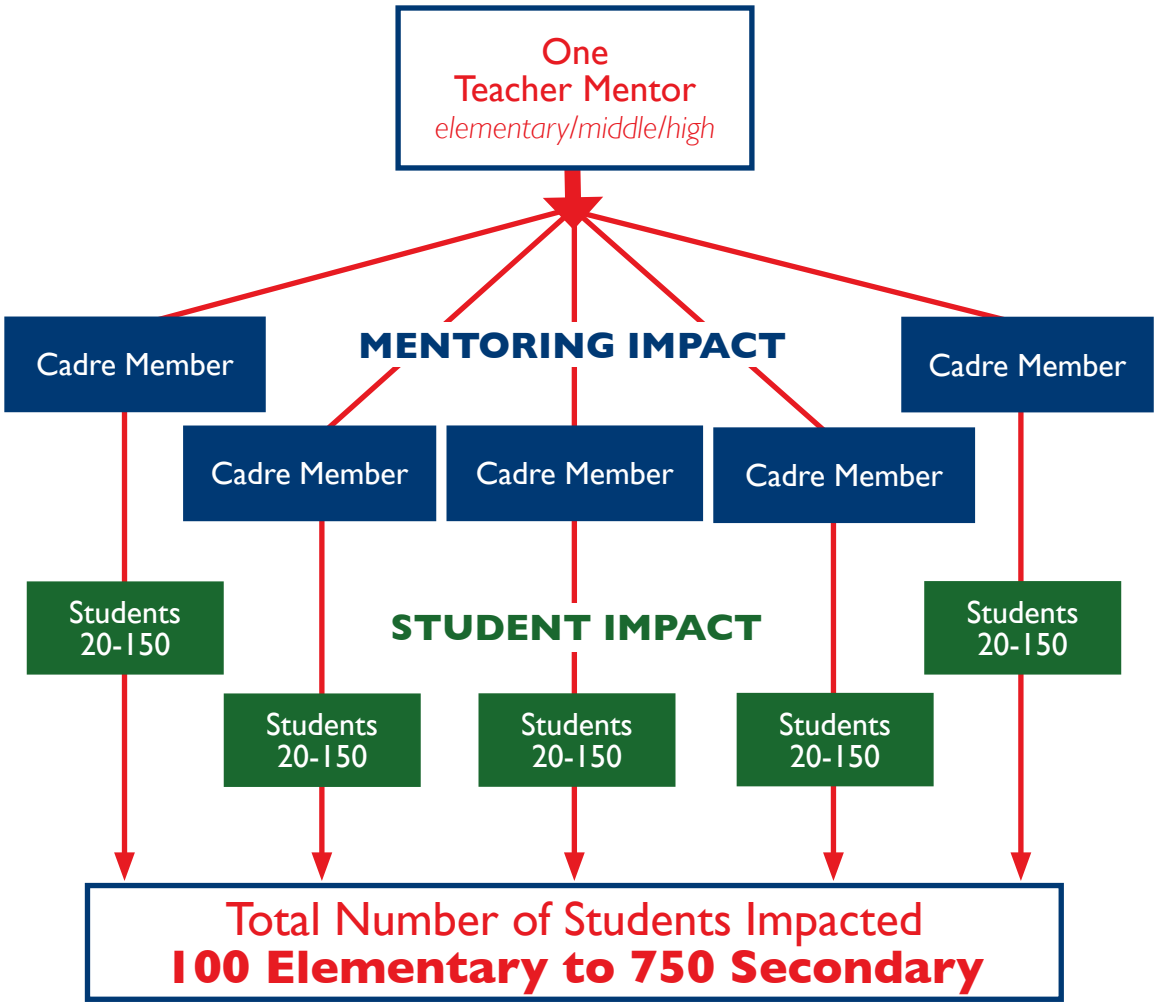
Sixteenth Annual Meeting

The Honorable Mark Strama
State Representative, District 50
Texas House of Representatives

Teachers Mentoring Teachers

TRC innovative professional development programs prepare teachers to mentor other teachers. Science Teacher Mentors (STMs) and Mathematics Teacher Mentors (MTMs) extend the reach of TRC programs far beyond their immediate impact. The programs nurture learning communities within schools and support networks among P-12 schools, community colleges, and universities. These connections develop and retain beginning teachers while rejuvenating experienced professionals.

Sharing Instructional Strategies



Mentoring Multiplies the Reach of TRC

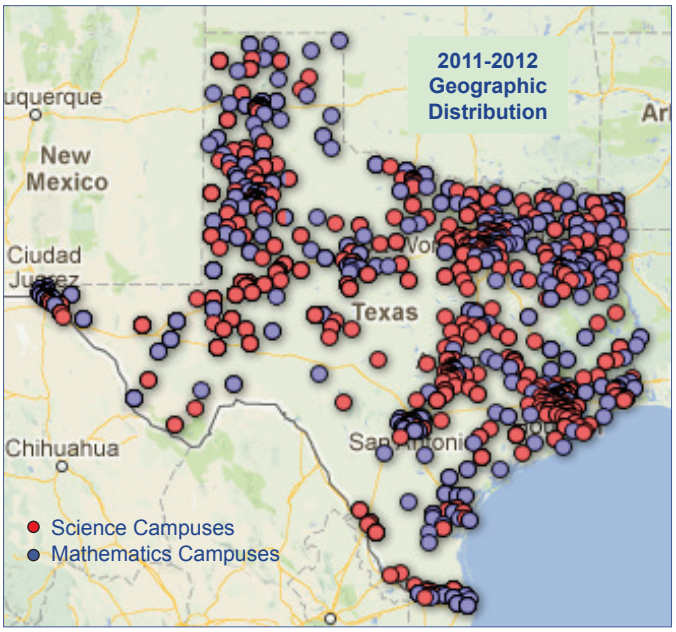
For over fourteen years, Texas Regional Science Collaboratives have used a mentorship model to conduct extensive professional development for teachers.

SCIENCE Collaborative programs require STMs to attend an average of 100 hours of professional development. These professional development activities provide teachers the opportunity to learn new science content, conduct field experiences and science explorations, and improve their instructional strategies to enhance the rigor and relevance of STEM education.

MATHEMATICS Collaborative programs require MTMs to attend an average of 100 hours of professional development. Mathematics professional development programs help teachers strengthen their content knowledge through problem solving, investigations, and connecting what they learn to classroom instruction, to everyday life, and to STEM careers.

Project Base Learning - Flat Creek PDA

District Participation in the TRC



In 2011-12, the Texas Science Regional Collaboratives served teachers in 2,427 campuses representing 739 school districts and charter schools and the Texas Mathematics Regional Collaboratives served teachers in 2,030 campuses representing 762 districts and charter schools.

SCIENCE	2011-2012	MATHEMATICS
39	COLLABORATIVES	27
739	DISTRICTS	762
2,427	CAMPUSES	2,030
1,574	TEACHER MENTORS	926
7,127	TOTAL TEACHERS	6,024
570,160	STUDENTS	506,016

One Year Data: May 1, 2011 - July 31, 2012

Student numbers based on an average student/teacher ratio of 80:1 in science and 84:1 in mathematics

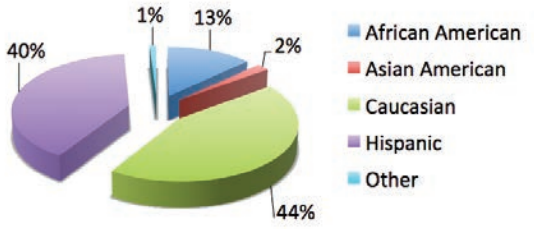
Effectiveness and Results

The effectiveness of teacher professional development is measured by its impact on teacher performance and student achievement. Research data from the field indicate a positive correlation between Texas Regional Collaboratives teacher professional development and student achievement.

Energy and Matter PDA

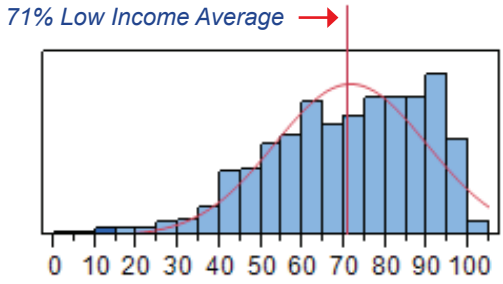
Numeracy PDA

Ethnicity of Students Served by Collaborative Teachers



Student Demographics

On average, the percent of students on free and reduced lunch at TRC campuses is 71%.



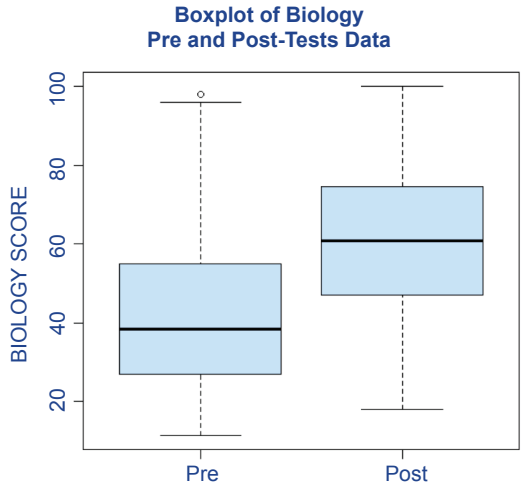
Geometry in Construction PDA

Impact on Students and Teachers

TEACHER IMPACT

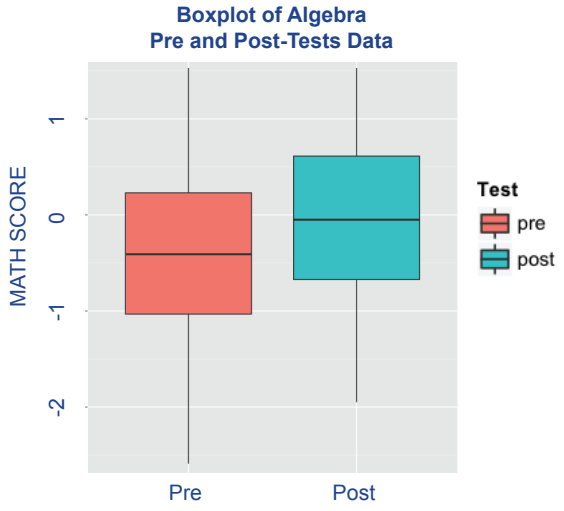
Biology Assessment 2011-2012

In science, 706 teachers completed a pre-post assessment related to "Energy and Matter in Biological Systems." According to the federal MSP standard, 504 of those teachers showed significant gains in content knowledge.



Learning Mathematics for Teaching: Patterns, Functions, and Algebra 2011-2012

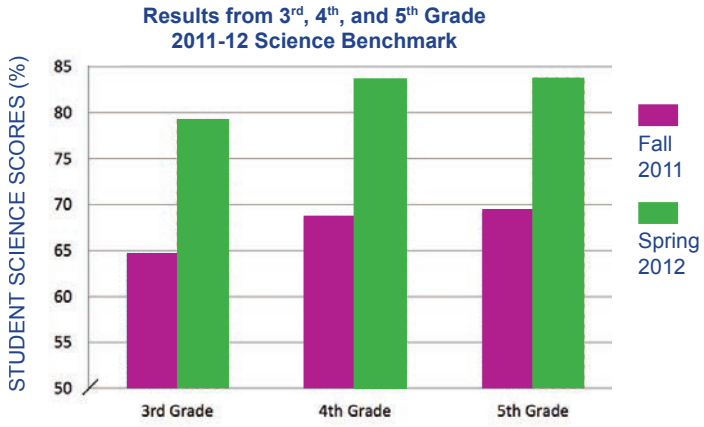
In mathematics, 323 teachers over all projects took pre-post assessments of teacher content knowledge. Gain scores from 114 teachers who completed Middle School Patterns, Functions and Algebra assessment, are shown here. The effect size was 0.4, which is considered a medium effect, and the difference between the pre- and post-test was significant.



STUDENT IMPACT

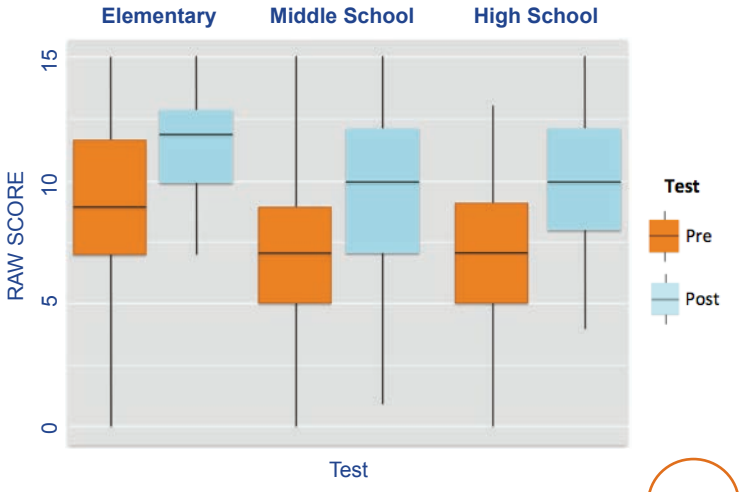
University of Houston Grade 3, 4, and 5 Science Benchmark Tests 2011-2012

The University of Houston Science Collaborative measured changes in student achievement by administering a pre-and post-assessment of science content covered in teacher training to 548 students of teachers in Grades 3-5 between the fall of 2011 and the spring of 2012. Paired t-tests showed statistically significant changes in student achievement over the school year their teachers participated in TRC training.



Region 4 Mathematics Student Achievement 2011-2012

The Region 4 Mathematics Collaborative developed several assessments of student achievement related to algebraic skills and algebra readiness in 2011-12. MTMs in Region 4 administered the assessment to their students at the beginning and end of the school year (total of 1,228 students). Students in all grade levels demonstrated statistically significant changes ($p<.05$) in their achievement and significant effect size improvements. Effect sizes were calculated at 0.73 for elementary students (N=78), 0.86 for middle school students (N=851), and 1.21 for high school students (N=299).



Significant Contributions

Marvin Odum

"It takes collaborative efforts and commitment of industry and academia to educate and train the workforce of the future. For that reason, Shell is pleased to support Texas Regional Collaboratives programs that enhance teacher skills and student understanding of math and science. These two disciplines are critical to addressing the energy and environmental challenges of the future."

Marvin E. Odum
President, Shell Oil Company

AT&T Foundation

Dave Nichols

"We know of no similar program in the nation that has done more for teachers of science and math than the Texas Regional Collaboratives. We at AT&T are honored to be a small part of this tremendous effort. AT&T commends Dr. Jbeily and his entire TRC staff as well as all of the members of individual collaboratives across the state for their intense focus on preparing Texas students for great success in the future."

Dave Nichols
President, AT&T-Texas

Shell-sponsored Field Trip

Commendations

"I feel so indebted to the TRC organization for my personal growth in science content as well as purposeful pedagogy. The networking, the support, and exposure to a group of like-minded science teachers have impacted not only my life, but that of my students and the students of teachers with whom I have shared information. My success as an educator is a direct result of my affiliation with this amazing organization."

Stef Paramoure
Science Middle School Teacher
New Braunfels ISD

"The Collaboratives advance the professional development of science teachers throughout our state, and ultimately improve the quality of science and mathematics teaching and learning across the state."

Dr. Manuel J. Justiz
Dean
College of Education
The University of Texas at Austin

"We, at The University of Texas, have placed a special emphasis on the University's role in supporting schools and teachers in schools to allow them to improve their effectiveness. An important part of that is the Texas Regional Collaboratives, led ably by Kamil Jbeily."

Dr. Larry Faulkner
Former President
The University of Texas at Austin

"The Texas Regional Collaboratives are a prime example of how The University of Texas is reaching out to the entire state. As I spread the word about how much UT does for the people of Texas, the outstanding science teachers that we're helping, the Collaboratives are always first on my list of examples."

Gwen Grigsby
Associate Vice President
Governmental Relations
The University of Texas at Austin

Texas Science Hall of Fame - January 16, 2001

Recognition by the Texas Senate, the Texas House of Representatives and Governor Rick Perry.

In the Senate Chamber from left to right:
Former Senator David Cain (resolution sponsor), Dr. Bernard Harris, Charles Duke, Dr. Jack Christie, Dr. William C. Davis, Dr. Manuel P. Berriozabal, Former Lt. Governor Bill Ratliff, Dr. Robert F. Curl, Dr. Gerald D. Skoog, the late Jack S. Kilby, Arleen Lawson, Dr. Kamil A. Jbeily, John Blaha, and Eugene A. Cernan

Participant Feedback

My junior high science teacher, Marsha Nixon, attended the SECO Earth Science and Energy Workshop this past Saturday. She really enjoyed the workshop and got a lot of good information, and she is especially excited about all the wonderful materials that she brought home from the workshop. She was showing me everything today: trade books, poster, classroom set of magnifying glasses, etc. She was like a child on Christmas morning! These are all items that she will certainly use in the classroom. Thank you so much for bringing the SECO workshop to ESC XV. According to Mrs. Nixon, it was worth giving up a Saturday.

Cordelia Kothmann
Principal, Menard Elem./JH, Menard ISD

I wanted to contact you and let you know how much I appreciate the TRC at North Central Texas College in Gainesville, Texas. This is my first year as a member of this Collaborative and I could never express how grateful I am for the workshops and trainings I have attended. I have not only been given new ideas to implement in my classroom, but I leave with the materials to actually do so.

I am 33 years old, but have been teaching for 12 years, I still feel young, but like many others in this line of work, I am often overwhelmed by the pressures of the "powers that be." Sara, Lee Ann and the other leaders of the Collaborative have eased the stress this year, by giving me the opportunity to learn new and exciting ways to teach instead of the same ol' technique and routine. I feel like I had a student-centered classroom, but I had no idea what that really meant until the Collaborative. Did I mention I teach HIGH SCHOOL MATH, and yet the majority of my kids love it, even those who normally struggle? They can tell when I have been to "TRC," because I immediately implement the lesson in my room. I have attended workshops ranging from Early Childhood Math to High School Science, and without fail I leave with something to use in my class.

Thank you for your support and allowing this to take place in my community, I travel 40 minutes one way for each of the trainings, but it is worth every minute. I recently told Sara, "I'm addicted," and I truly am. I simply can't get enough of the TRC, I feel like a child again, eager to learn and ready to teach anyone who will listen! Thanks again,

Deanna Messer
Mathematics Teacher, Nocona High School, Nocona ISD

Geology Field Trip PDA

Mathematics Project Based Learning - Flat Creek PDA

Dear Dr. Fletcher,
This is just a note to let you know how very much my students and I have gained by having access to the Science Collaborative meetings I have been attending at the University of North Texas under Dr. Roberts and Dr. Crocker. The training I receive from there each month goes DIRECTLY into my lessons in the classroom. I know beyond a doubt that they have not only made me a better teacher, but have inspired lessons and learning that captivate my students and make them that much more invested in their learning. I highly recommend these classes to EVERY science teacher I know. These meetings have quickly become a necessity to my professional development and they alone have done more to raise my teaching ability than ALL of the other professional development classes I have taken combined. It is my belief that the Collaborative classes should be a requirement for anyone teaching science in our state.
Sincerely,

Julie Rhea
Science Teacher, Dorsey Elementary, Dallas ISD

WOW, what a wonderful, first class evening I spent last night. I love the TRC guy, who always makes me feel appreciated and who motivates me. I challenged myself to have more patience with some very difficult students today and so far I am succeeding. "What can I do better today!" :) I really miss going to all the wonderful workshops and seeing you (Kay Olds), Lisa, and Janna (Fun group). I learned about so many strategies, resources, etc. that have improved my teaching, and I have shared them. My students love the math songs, cheers, rhymes, etc. and we even made up our own. These help them remember concepts easily, and it makes learning fun. You taught me different strategies than the many I was already using and vocabulary to be emphasized more. Thanks for the wealth of knowledge shared.

Also, my students thought it was Christmas as I unpacked my goodie bag. As always you are very generous. Thanks.

Cheryl Adams
Mathematics Teacher, China Elementary, Hardin-Jefferson ISD

State, Federal, and Corporate Funders and Partners

State and Federal Collaborators and Funders

Texas Education Agency

U.S. Department of Education

National Science Foundation

The University of Texas at Austin

Statewide Corporate and Foundation Partners

Shell

AT&T Foundation

The Cynthia and George Mitchell Foundation

Statewide Corporate and Foundation Program Officers

Dr. Frazier Wilson
Vice President
Shell Oil Company Foundation

Bob Digneo
Assistant Vice President, Regulatory
AT&T

Meredith Dreiss
Past President and Board Member
The Cynthia and George Mitchell Foundation

Project Contributors

Fluor

IBM

In addition to Project Statewide Contributors, the TRC has over fifty business and community partners at the regional level.

Special Programs/Research Projects

Beginning Teacher Induction and Mentoring Program (BTIM)

The Beginning Teacher and Induction Mentoring (BTIM) program administered by the Texas Regional Collaboratives (TRC) supports early career math and science teachers to increase their retention and effectiveness. The program provides professional development in mentoring, content, pedagogy, assessment, and other instructional strategies necessary for the success of beginning science and mathematics teachers. Induction includes high-quality mentoring, common planning to collaborate on strategies to improve student achievement, ongoing professional development tailored for the beginning science and mathematics teacher, and learning communities.

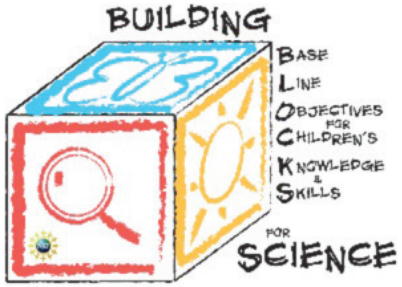
Since the program began in the fall of 2009, the TRC has provided 1,792 new science and mathematics teachers on 469 school campuses across the State of Texas with mentoring support from 854 veteran educators. BTIM project ended May 30, 2013. Funds to resume the BTIM project are being pursued.

STR2EAM Workshop

Early Childhood Science Research

The NSF-funded Building BLOCKS for Science research study involves:
(1) extensive classroom observation by teachers and researchers of Prekindergarten children's ability to learn science processes and content,
(2) delivery of intensive professional development and mentoring support for Pre-K teachers to learn science, and
(3) development of qualitative and quantitative assessment strategies.

This project offers a unique opportunity to investigate the boundary between Pre-K and K-2 science understanding and build a foundation for subsequent knowledge and skills acquisition, asking and answering the question: "What can we expect children entering Kindergarten to know and be able to do in science?" Data collection is now complete while data analysis is still underway. Results of the research will be reported at various national conferences in spring 2013 and articles about the project are under review. A set of performance assessment activities for prekindergarten children will be ready for dissemination this summer.



thetrc.org/web/blocks.html

Research Project: Immersion Model

Immersion Model

Beginning in the 2011-12 project year, the TRC began piloting a new design for school level intervention called the Immersion Model. In an immersion school, every teacher at a specified grade level must receive TRC training. As such, when campus level standardized test scores are used to examine the relationship between TRC training and student achievement, a valid inference can be made that all teachers who impacted student scores that year had received TRC training. For the 2012-13 project year, every Regional Collaborative is required to identify a minimum of five immersion campuses for whom they will provide professional development services.

There are two distinct advantages to the immersion model. First, research has shown that whole-school professional development models are more effective for systemic, long-lasting change, and have a more positive impact on student learning. Providing a coherent program of professional development for an entire grade level, as described in the immersion model, is a good step in this direction. The second advantage is related to program evaluation. One of the greatest challenges for a Regional Collaborative (RC) is designing a plan that adequately measures the impact of professional development on student achievement in a meaningful way. Ideally, Regional Collaboratives would measure student achievement at the teacher level. However, accessing student data clustered by teacher is extremely difficult given the current design of the Texas student data collection system. To deal with this challenge, Regional Collaboratives are strongly encouraged to utilize an immersion model that provides professional development to all teachers at a campus at a specific tested grade level for the purpose of collecting campus level STAAR data. While the TRC and sponsoring agencies benefit from receiving a rich data set for further analysis, students can benefit from this model as well.

In the immersion model, projects must recruit a team of Mentors and CMs that represent all teachers on a campus at a tested grade level/subject for the purpose of collecting campus level STAAR data. Identifying a specific tested grade level to target, and offering a full immersion program for staff members that teach at this grade level on multiple campuses, will facilitate a more valid mechanism for determining the impact of the program on student achievement at the campus rather than teacher level.

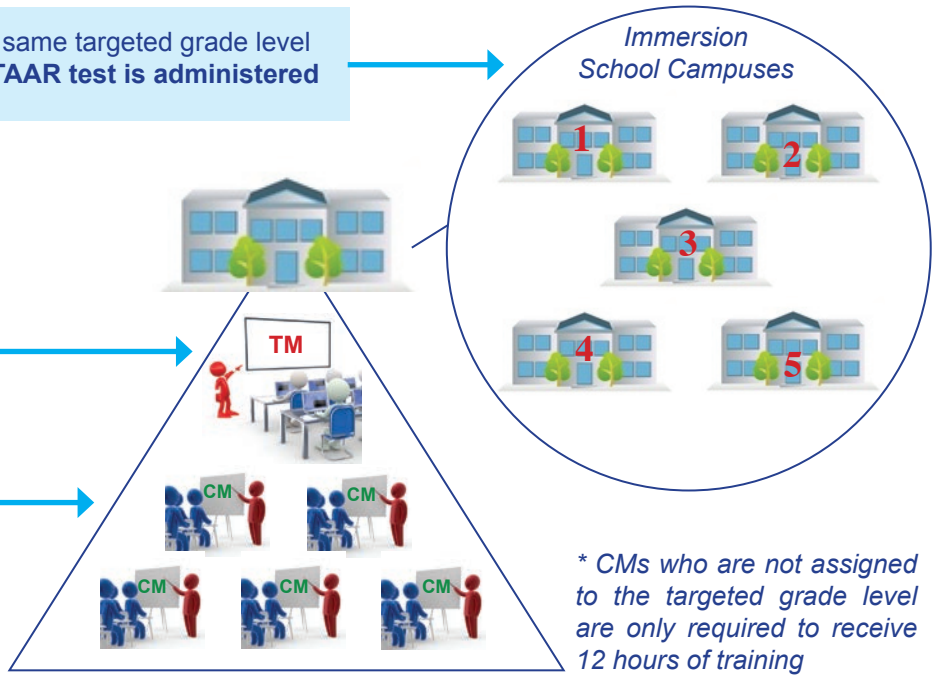
TRC IMMERSION MODEL

To achieve an Immersion Model, TRC training must be provided as per the following requirements:

A **minimum of 5 campuses** with the same targeted grade level or subject (high school) for which a **STAAR test is administered**

Each campus must have:

- At least **one Teacher Mentor** (STM or MTM) at the targeted grade level trained by the Regional Collaborative
- **Cadre Members** (CMs) at the targeted level who must earn on average **24 contact hours*** of Professional Development from a Regional Collaborative. (If only one teacher is assigned to the immersion grade level, a campus may not have any immersion CMs)



** CMs who are not assigned to the targeted grade level are only required to receive 12 hours of training*

TRC Online Learning Community and Professional Development

The TRC Online Learning Community (TOLC) is sponsored collaboratively by Shell and AT&T Foundation. Training on the use of podcasting to support professional development has been offered at PDAs attended by representatives from across the state. To assist Project Directors and classroom teachers across Texas, the video podcast entitled *Technology Tips for Classroom Teachers* has been developed and made available on the TRC website and the iTunes Store. Web-based conferencing through Adobe Connect software is currently utilized to provide on-demand "anytime, anywhere" synchronous communication, collaboration, and training opportunities including Project Director meetings and hands-on technology integration sessions.

TOLC provides an online infrastructure to help build community and inform TRC participants of upcoming and updated professional development opportunities through the use of contemporary Web 2.0 communication tools. TOLC supports increased communications across the TRC by providing multiple tools for synchronous and asynchronous communication.

The functionality provided by the evolving infrastructure of TOLC, *Technology Tips for Classroom Teachers*, and web-based video conferencing, currently supports:

- Journaling by all participants
- Webinars to provide online meetings and instruction
- Email lists to support ongoing communication for working groups
- Forums for threaded discussion
- Chat rooms available any time for live discussion
- Online courseware for professional development
- A state-wide podcasting network for distribution of media-based professional development
- Anytime, anywhere on-demand training content on computers and mobile digital media devices

The TRC also leverages social media services including Facebook, Twitter, and YouTube to enhance professional development initiatives and provide opportunities for developing learning communities.

Our Facebook page is continuously updated with:

- STEM (Science, Technology, Engineering, Mathematics) news and articles
- Grant opportunities
- Instructional technology resources
- Contributed resources and announcements from the Texas Regional Collaboratives community

The microblogging service, Twitter, is integrated with the TRC Facebook page allowing educators and project directors to efficiently establish Personal Learning Networks (PLNs). The TRC YouTube Channel currently hosts video content including key segments from the Seventeenth Annual Meeting, annual progress report "how-to" tutorials, TRC and corporate-sponsored Collaborative initiatives, and much more. Leveraging these social media outlets allows TRC participants and educators throughout the state and nation to establish learning communities with a common goal: to serve STEM educators and improve student learning.

Interstate Activities

Louisiana Regional Collaboratives for Excellence in Science and Mathematics Teaching

The Louisiana Outreach Project

Two Regional Collaboratives Funded Through the Shell-TRC Partnership

LSU/Southern University Regional Collaborative

The Louisiana State University/Southern University Regional Collaborative continues to expand its reach under the direction of the TRC. The program leverages resources by partnering with the National Science Foundation, Louisiana Department of Education and U.S. Department of Education among other education initiatives.

This past year, the Collaborative provided mathematics and science leadership/professional development services to 172 K-12 veteran and pre-service teachers and 24 Collaborative Fellows across the service area; 48 of the Collaborative teachers received at least 100 hours of intense professional development this past academic year. Special professional development events included presentations in engineering in partnership with the LSU College of Engineering.

Partnering with SU and the Livingston LIGO research facility showcased new Exploratorium Science Snacks. To continue efforts to increase the STEM pipeline, middle school students were impacted through the sponsorship of the 2012 Sally Ride Science Festival as well as Future City and You Be The Chemist competitions. As a result of these activities, the LSU/SU Collaborative has strengthened outreach services at both Louisiana State University and Southern University.

Honoring the Teachers Event (2010)
Louisiana State University, Baton Rouge, LA

(l to r) **Dr. Joseph Meyinsse**, Project Director, Southern University Regional Collaborative, **Dr. Jacqueline Howard**, Provost Southern University, and **Dr. Kamil A. Jbeily**

(l to r) **Dr. Astrid Merget**, Provost Louisiana State University, **The Honorable Austin J. Badon, Jr.** Chair, House Education Committee Louisiana House of Representatives, and **Dr. Brenda Nixon**, Project Director, Louisiana State University

Louisiana Tech University/Grambling State University Regional Collaborative

The Louisiana Tech University/Grambling State University Regional Collaborative program has had a significant impact on teachers in north Louisiana. A total of 550 teachers participated in professional development programs offered through the Collaborative. The program has partnered with other related programs, such as the GK-12, and NSF-funded HBCU UP and RET and most recently the RET program that is part of the Louisiana Alliance for Simulation Guided Materials Applications contract with NSF (LA-SiGMA). Past activities include the nanoScience day, the nanoSCIENCE summer research workshops, and the nanoSCIENCE Investigative Sciences program. In addition, the F.U.E.L. for thought program, a one-week workshop designed to expose teachers to alternative energy research was offered as part of the summer programs for teachers.

The Louisiana Tech/Grambling State Collaborative has evolved into a highly integrated program in summer 2011; groups of teachers from each university worked together in common activities at both universities. More recently, 4 mentors recruited from previous activities at both campuses delivered a presentation on mentoring at the 2012 LATM/LSTA Joint Conference in Shreveport, Louisiana which was attended by 23 teachers and school administrators from around the Louisiana State. This group of mentors will also lead a workshop on time management, mentoring and networking in February and a follow up workshop in April 2013, where new teachers will start their evolution from being teachers to becoming teacher-leaders.

Honoring the Teachers Event (2010)
Grambling State University, Grambling , LA

Dr. Pedro Derosa, Project Director, Louisiana Tech University/ Grambling State University Regional Collaborative, and **Dr. Les Guice**, Executive Vice President, President-elect, Louisiana Tech University

TRC Collaboratives and Projects (2013-2014)

Regional Mathematics and Science Collaboratives

R	M	S	REGIONAL COLLABORATIVES
1	♦	♦	Region 1 Collaborative/*Edinburg*
	♦	♦	UT Brownsville Regional Collaborative/*Brownsville*
		♦	TAMU International Regional Collaborative/*Laredo*
2	♦		Region 2 Collaborative/*Corpus Christi*
		♦	Texas State Aquarium-ESC 2 Regional Collaborative/*Corpus Christi*
3	♦	♦	Region 3 Collaborative/*Victoria*
4	♦	♦	Region 4 Collaborative/*Houston*
		♦	Rice University Regional Collaborative/*Houston*
		♦	Galveston County Regional Collaborative/*Galveston*
	♦	♦	Lake Houston Regional Collaborative/*Humble*
		♦	UHCL Regional Collaborative/*Houston*
		♦	UH Regional Collaborative/*Houston*
5	♦	♦	Region 5 Collaborative/*Beaumont*
6	♦		Region 6 Collaborative/*Huntsville*
		♦	TAMU-College Station Regional Collaborative/*College Station*
7	♦	♦	Region 7 Collaborative/*Kilgore*
	♦	♦	UT Tyler Regional Collaborative/*Tyler*
8	♦	♦	Region 8 Collaborative/*Mount Pleasant*
9	♦	♦	Region 9 Collaborative/*Wichita Falls*
10	♦	♦	Region 10 Collaborative/*Richardson*
		♦	Southern Methodist University Regional Collaborative/Dallas
		♦	UT Dallas Regional Collaborative/*Dallas*
11	♦	♦	Region 11 Collaborative/*Fort Worth*
	♦	♦	North Central Texas College Regional Collaborative/*Gainesville*
		♦	University of North Texas Regional Collaborative/*Denton*
12	♦	♦	Region 12 Collaborative/*Waco*
13	♦	♦	Region 13 Collaborative/*Austin*
		♦	UT Austin-College of Nat. Sci. Regional Collaborative/Austin
14	♦	♦	Region 14 Collaborative/*Abilene*
15	♦	♦	Region 15 Collaborative/*San Angelo*
16	♦	♦	Region 16 Collaborative/*Amarillo*
17	♦	♦	Region 17 Collaborative/*Lubbock*
18	♦	♦	Region 18 Collaborative/*Midland*
19	♦	♦	Region 19 Collaborative/*El Paso*
20	♦	♦	Region 20 Collaborative/*San Antonio*
		♦	OLLU Regional Collaborative/*San Antonio*
	24	34	

R: Region **M**: Mathematics **S**: Science

The Louisiana Outreach Project

Two Louisiana Regional Collaboratives are supported by the Shell-TRC Partnership:

Louisiana State University/Southern University Regional Collaborative

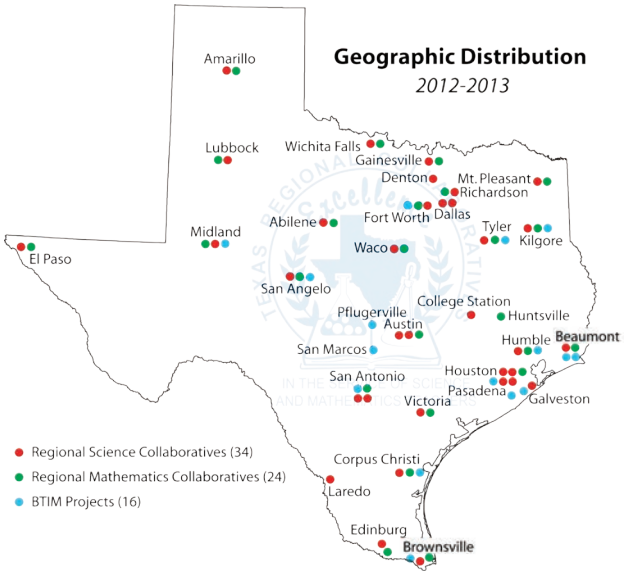
Louisiana Tech University/Grambling State University Regional Collaborative

BTIM (Beginning Teacher Induction and Mentoring)

R	M	C	S	INSTITUTIONS
1		♦		UT Brownsville/*Brownsville*
2		♦		Texas State Aquarium-ESC 2/*Corpus Christi*
4			♦	Galveston County/*Galveston*
			♦	Humble ISD/*Humble*
			♦	Pasadena ISD/*Pasadena*
			♦	University of Houston/*Houston*
5	♦		♦	Region 5 ESC/*Beaumont*
7		♦		Region 7 ESC/*Kilgore*
		♦		UT Tyler/*Tyler*
11		♦		Region 11 ESC/*Fort Worth*
13		♦		Pflugerville ISD/*Pflugerville*
			♦	Texas State University/*San Marcos*
15			♦	Region 15 ESC/*San Angelo*
18			♦	Region 18 ESC/*Midland*
20			♦	OLLU/*San Antonio*
	16			

R: Region **M**: Mathematics **S**: Science
C: Combined Science/Math

For names of Project Directors and contact information, please visit
www.theTRC.org



58 Partnering Institutions of Higher Education (2012-13)

Abilene Christian University
Amarillo College
Angelo State University
Austin Community College
Baylor University
Concordia University Texas
Del Mar College
Hardin-Simmons University
Kansas University
Lamar University
Lee College
Lone Star College - Kingwood
Midland College
Midwestern State University
North Central Texas College
Our Lady of the Lake University
Rice University
Sam Houston State University
Stephen F. Austin State University
Sul Ross State University
Southern Methodist University
Texarkana College
Texas A&M University System
- TAMU International
- TAMU -Agricultural Research and Extension Center at Beaumont
- TAMU - College Station
- TAMU - Commerce
- TAMU - Corpus Christi
- TAMU - Galveston
- TAMU - Texarkana

Texas Christian University
Texas Southern University
Texas State University
Texas Tech University
Texas Tech University / T-STEM
Texas Women's University
University of Houston
University of Houston-Clear Lake
UH-Clear Lake/Environmental Institute of Houston
University of Northern Iowa
University of Dallas
University of North Texas
The University of Texas System
- University of Texas at Arlington
- University of Texas at Austin
- University of Texas at Austin, Bureau of Economic Geology
- University of Texas at Austin, McDonald Observatory
- University of Texas at Brownsville
- University of Texas at Dallas
- University of Texas at El Paso
- University of Texas - Pan American
- University of Texas of the Permian Basin
- University of Texas at Tyler
- University of Texas Medical Branch
- University of Texas M.D. Anderson Cancer Center

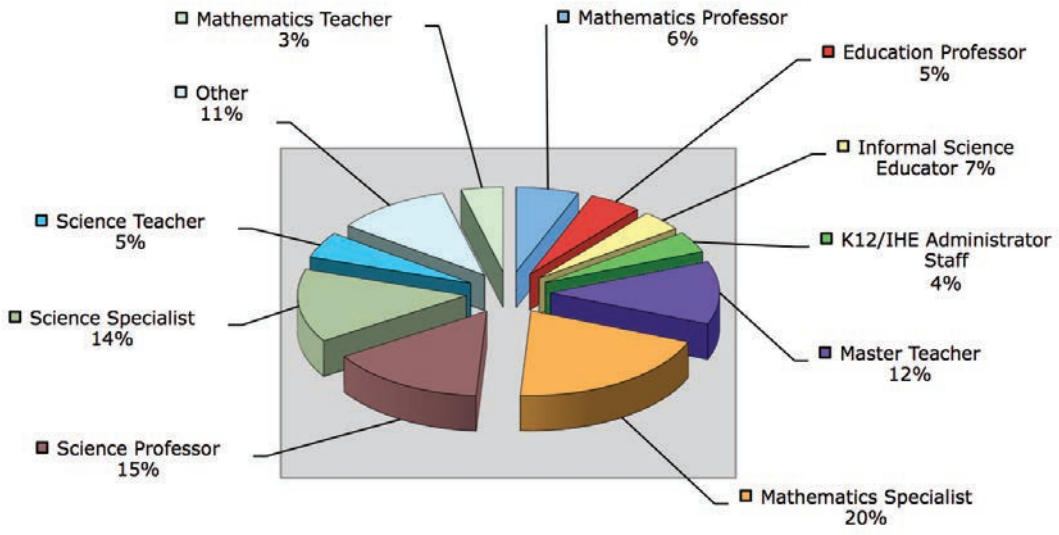
University of the Incarnate Word
Victoria College
West Texas A&M University

Texas Regional Collaboratives

Instructional Team Members (ITMs) Classification Distribution

(Professors Representing 58 Institutions of Higher Education)

2012-2013



ITMs are the providers of professional development at the regional level

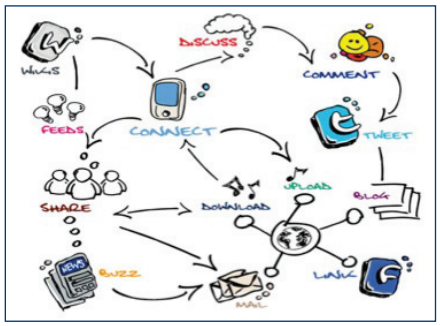
Attributes of Successful Regional Collaboratives

Partnerships

Successful Regional Collaboratives are partnerships that bring together The University of Texas at Austin, Education Service Centers, institutions of higher education, school districts, the business community, and foundation partners to design and implement exemplary TEKS-based professional development for teachers using research based instructional models, materials and best practices. Partners leverage funds and resources to synergize activities and maximize the impact on teachers and students.

Service

Successful Regional Collaboratives adopt a culture that genuinely and consistently treasures and serves teachers and educators, assists schools in developing highly qualified teachers, and provides funders excellent returns on their investment in the program.



Communication

Successful Regional Collaboratives commit to sustained and timely communication (e-mail, phone calls, FYIs, visits, meetings with members of the Regional Collaboratives, superintendents, principals, curriculum directors, teachers, higher education professors and administrators, TRC staff, local business partners, and others); ensure that all partners are satisfied with the return on their investment in the partnership; and disseminate the project activities and results at local, regional, state, and national meetings and conferences.

Accountability

Successful Regional Collaboratives fulfill the project *Statement of Work* in (1) designing and conducting professional development as planned; (2) attending TRC Professional Development Academies, Project Directors Meetings, and Annual Meetings; and (3) communicating with the fiscal agent business office and administrators to manage the grant and expend ALL budgeted funds in a timely fashion.

Results

Successful Regional Collaboratives conduct evaluation studies to measure the impact of the professional development on teachers' knowledge and skills, their performance in the classroom, and most importantly, on student achievement.

Texas Regional Collaboratives Team

Kamil A. Jbeily, Ph.D.
Founder and
Executive Director
512-471-9460
kjbeily@austin.utexas.edu

Charter Member,
Texas Science Hall of Fame

James P. Barufaldi, Ph.D.
Principal Investigator
512-471-7354
jamesb@austin.utexas.edu
Director, Center for Science and Mathematics Education
The University of Texas at Austin

Rubén E. Hinojosa Regents Professor in Education

Nathalie Beausoleil
Documentation Specialist
512-232-6208
nathalie.b@austin.utexas.edu

Jeff Early
Manager of Business Affairs
512-471-9279
jaearly@austin.utexas.edu

Carol Fletcher, Ph.D.
Associate Director
512-232-5690
carol.fletcher@austin.utexas.edu

Stephen Gray
Webmaster/Technical Operations Manager
512-471-9400
stephen.gray@austin.utexas.edu

Karl Hereim
Grants and Contracts Specialist
512-471-7408
khereim@austin.utexas.edu

Mary Hobbs, Ph.D.
Coordinator for Science Initiatives
512-471-8729
maryhobbs@austin.utexas.edu

Debra L. Junk, Ph.D.
Coordinator for Mathematics Initiatives
512-232-0880
junkdeb@utexas.edu

Kris Mason
Assistant to the Executive Director
512-232-6207
kmason@austin.utexas.edu

George Perry
DataCenter Coordinator
512-471-6183
gperry@austin.utexas.edu

John Solis, Ph.D.
Coordinator for Technology Initiatives
512-471-6862
john.solis@austin.utexas.edu

Amy Werst
Coordinator for Special Projects
512-471-7450
amy.werst@austin.utexas.edu

Marsha Willis
Professional Development Coordinator
512-232-5015
marshawillis@austin.utexas.edu

Project Support

Jair Aguilar - jair.aguilar@utexas.edu
Clare Coleman - ccoleman812@utexas.edu
Nick Laguzza - nickl1989@gmail.com
Cynthia Lima - cynesperanza@yahoo.com.mx
Casey Powers - caseyblairp@yahoo.com

Special Projects Assistant

Gail Seale - gails@austin.utexas.edu

"Thank you" to our wonderful Project Directors!

Mathematics Project Directors

Science Project Directors

Texas Regional Collaborative

Effective Professional Development*

- Focuses on teachers and respects and nurtures the capacity of teachers.
- Reflects best available research and practice.
- Is planned collaboratively with teachers.
- Develops content and pedagogy.
- Enhances leadership.
- Is long-term, sustained, and of high intensity.
- Makes a positive impact on teacher performance and student achievement.
- Requires ample time.
- Promotes commitment to continue inquiry and improvement.
- Is driven by a coherent long-term plan.
- Is evaluated on the basis of its impact on teachers and students, and this assessment guides subsequent effort.

**U.S. Department of Education Principles of Effective Professional Development*

Texas Regional Collaboratives
for Excellence in Science and Mathematics Teaching
Center for STEM Education
College of Education
The University of Texas at Austin
Mailing Address: 1912 Speedway D5500
Physical Address: Sánchez Building, Suite 340
Austin, Texas 78712-1608
Tel: 512-471-9400 Fax: 512-471-9244

www.thetrc.org