

Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching

TRC At-A-Glance

WHO WE ARE

The Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching (TRC) is an award-winning statewide network of 64 P-16 partnerships (Regional Collaboratives) that provide sustained and high intensity professional development to P-12 teachers of science and mathematics across the state. This infrastructure of over 58 institutions of higher education collaborating with the Texas Education Agency, Education Service Centers, school districts, and business partners, has a 20-year track record of designing and implementing exemplary professional development using research-based instructional models, materials, and best practices. In addition, the TRC network includes 25 projects (BTIM and Mid-Career) that focus on teacher mentoring, recruitment, and preparation.

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.

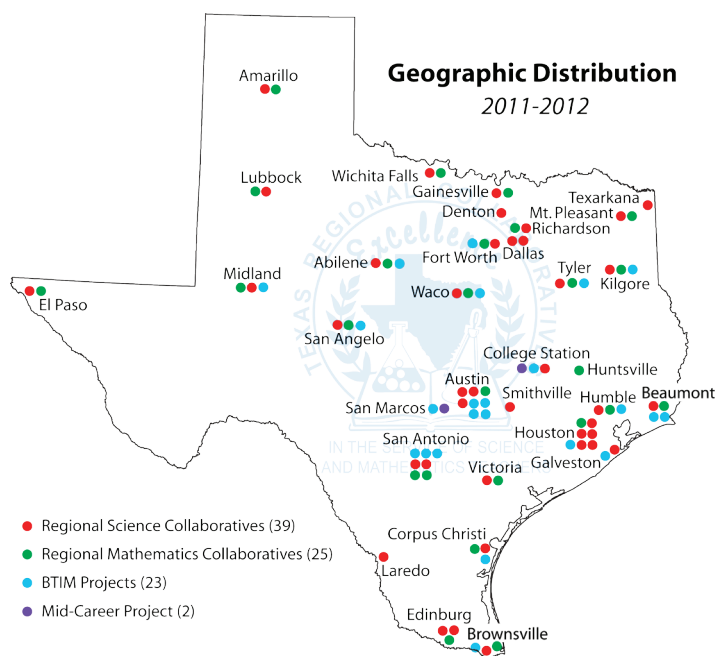
ACTIVITIES

- **Professional Development Academies (PDAs)** are provided to Instructional Teams that consist of professors of education, science, mathematics, and engineering, instructional specialists and master teachers.
- **Professional Development Programs (PDPs)** are designed by instructional teams at each Regional Collaborative to provide 100 contact hours of TEKS-based professional development to prepare teachers to become Science Teacher Mentors (STMs), and Mathematics Teacher Mentors (MTMs).
- **Honoring the Teachers** events recognize and honor participating teachers and engage policy makers, legislators, and state leaders in the program.
- The **Annual Meeting** brings together teacher leaders, education and business leaders, policy makers, and legislators to share, network, communicate, and celebrate the achievements of the Collaboratives.

SCIENCE	2010-2011	MATHEMATICS
38	COLLABORATIVES	27
779	DISTRICTS	816
2,800	CAMPUSES	2,485
1,545	TEACHER MENTORS	1,036
5,450	TEACHERS	5,267
509,056	STUDENTS	426,360

One Year Data: August 1, 2010 - July 31, 2011

Student numbers based on an average student/teacher ratio of 64:1 in science and 57:1 in mathematics



ACHIEVEMENTS

- Over two 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 33,000 science and mathematics teachers 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.
- 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.

Texas Regional Collaboratives Program Components



Sixty-four Regional Collaboratives

- 39 Science Collaboratives
- 25 Mathematics Collaboratives

Each Regional Collaborative focuses on participating teachers by:

- Enhancing their science or mathematics content knowledge,
- Improving their instructional skills, and
- Building their leadership capacity so that they can serve as a resource to improve student achievement throughout their school or district.

Beginning Teacher Induction and Mentoring Program (BTIM)

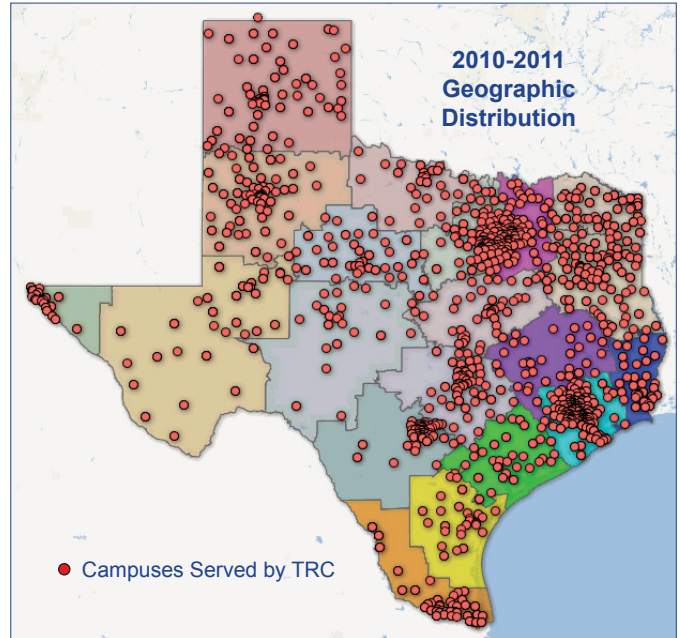
Initiated in September 2008 with funding from the Texas Education Agency, the BTIM program is designed to increase retention of beginning science and mathematics teachers by assigning a qualified mentor teacher to each classroom teacher who has less than two years of teaching experience. Mentors provide weekly support to novice teachers through coaching, team teaching, observations, and sharing of resources.

Mid-Career Teacher Recruitment Program

The goal of this program, implemented in September 2009 with funding from the Texas Education Agency, is to increase the number of certified science and mathematics teachers in Texas through recruitment of mid-career professionals with degrees in science, mathematics, engineering, and technology fields to teach in Texas schools. Mid-Career projects recruit, train, certify, place, and mentor those STEM professionals in high-need schools across the state.

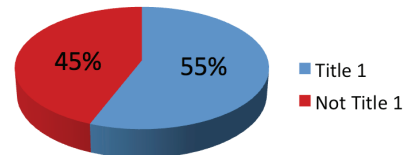
Early Childhood Science Research

The NSF-funded *Building BLOCKS for Science* research study involves extensive classroom observation by teachers and researchers of prekindergarten children's ability to learn science processes and content, delivery of intensive professional development and mentoring support for prekindergarten teachers to learn science, and development of qualitative and quantitative assessment strategies.

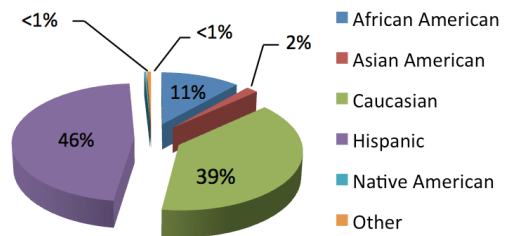


In 2010-2011 the Texas Science Regional Collaboratives served teachers in **779 school districts and charter schools** and **2,800 campuses** and the Texas Mathematics Regional Collaboratives served teachers in **816 districts and charter schools** representing **2,485 campuses**. The red markers in the TRC Campus map above represent all **5,285 campuses** served by the TRC in 2010-2011.

Title 1 Status of Participating Campuses



Ethnicity of Students Served by Collaborative Teachers



Based on a sample of 3,418 teachers who provided campus poverty level data for 2010-2011

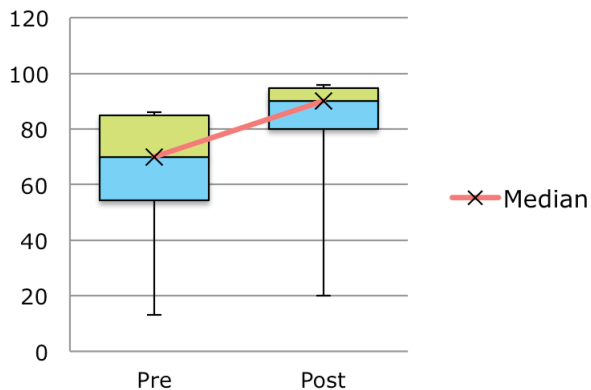
Effectiveness and Results

CONTENT KNOWLEDGE

Biology Assessment 2010-2011

The biology pre and post-test scores were analyzed across 12 Collaboratives for a total of 367 teachers. The difference between the pre and post-test was significant with an effect size of 0.9, which can be considered as a large effect.

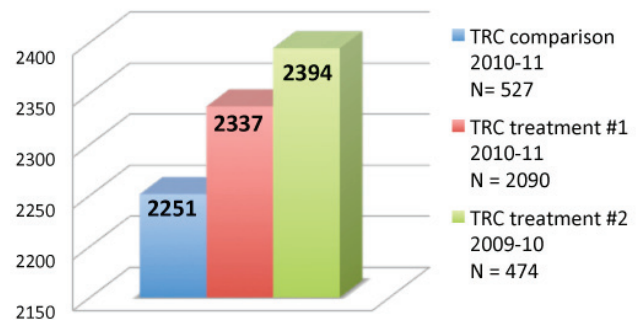
Boxplot of Biology Pre and Post-Tests Data



STUDENT IMPACT

Rice University Science Mean Scale Score Grade 5 Science TAKS 2011

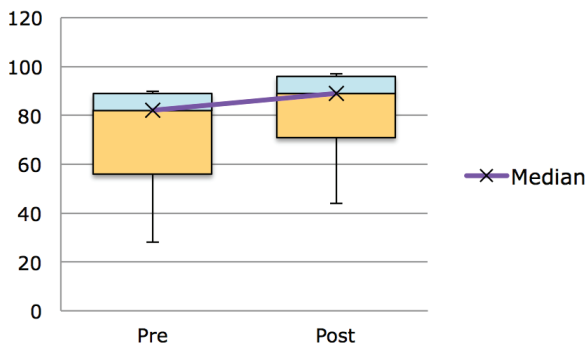
The Rice University Collaborative examined student data from three groups of teachers. Students of TRC comparison group teachers received no professional development from the TRC in 2010-11 and achieved a mean scale score of 2251 on the Grade 5 TAKS in 2011. Students of TRC treatment #1 teachers (who received weekly professional development in 2010-11), demonstrated a higher average scale score of 2337. The greatest impact was seen in TRC treatment #2 teachers. These students, who benefited from being assigned to teachers that had received a full year of TRC training in 2009-10, showed an average scale score of 2394 in 2011, exceeding the comparison group by 143 points.



Algebra Assessment 2010-2011

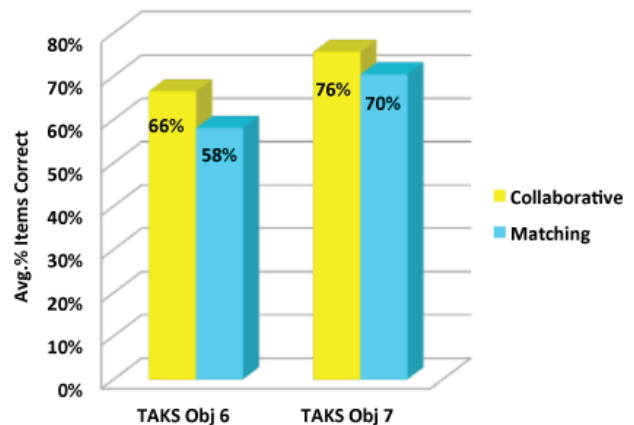
The algebra pre and post-test scores were analyzed across 2 Collaboratives for a total of 52 teachers. The difference between the pre and post-test was significant with an effect size of 0.4, which can be considered as a medium effect.

Boxplot of Algebra Pre and Post-Tests Data



UT-Tyler Fostering Geometric Thinking Grade 10 TAKS 2010-2011 - Objectives 6 and 7

The impact of TRC math professional development "Fostering Geometric Thinking" on math student achievement is significant as demonstrated by the figure below. Students who had TRC mentor teachers significantly outperformed the matching group of students who had Non-TRC mentor teachers on TAKS objectives 6 and 7.



Number of students in Collaborative teacher classrooms = 67
 Number of students in Comparisons group classrooms = 70

TRC Collaboratives and Projects At-A-Glance (Project Year 2011-2012)

Regional Mathematics and Science Collaboratives

R	M	S	REGIONAL COLLABORATIVES
1	●	●	Region 1 Collaborative/ <i>Edinburg</i> UT Pan American Regional Collaborative/ <i>Edinburg</i> UT Brownsville Regional Collaborative/ <i>Brownsville</i> TAMU International Regional Collaborative/ <i>Laredo</i>
2	●	●	Region 2 Collaborative/ <i>Corpus Christi</i> Texas State Aquarium-ESC 2 Regional Collaborative/ <i>Corpus Christi</i>
3	●	●	Region 3 Collaborative/ <i>Victoria</i>
4	●	●	Region 4 Collaborative/ <i>Houston</i> Rice University Regional Collaborative/ <i>Houston</i> Galveston County Regional Collaborative/ <i>Galveston</i> Lake Houston Regional Collaborative/ <i>Humble</i> UHCL Regional Collaborative/ <i>Houston</i> UH-Downtown Regional Collaborative/ <i>Houston</i> Aldine ISD Regional Collaborative/ <i>Houston</i>
5	●	●	Region 5 Collaborative/ <i>Beaumont</i>
6	●	●	Region 6 Collaborative/ <i>Huntsville</i> TAMU-College Station Regional Collaborative/ <i>College Station</i>
7	●	●	Region 7 Collaborative/ <i>Kilgore</i> UT Tyler Regional Collaborative/ <i>Tyler</i>
8	●	●	Region 8 Collaborative/ <i>Mount Pleasant</i> TAMU-Texarkana Regional Collaborative/ <i>Texarkana</i>
9	●	●	Region 9 Collaborative/ <i>Wichita Falls</i>
10	●	●	Region 10 Collaborative/ <i>Richardson</i> Southern Methodist University Regional Collaborative/ <i>Dallas</i> UT Dallas Regional Collaborative/ <i>Dallas</i>
11	●	●	Region 11 Collaborative/ <i>Fort Worth</i> North Central Texas College Regional Collaborative/ <i>Gainesville</i> University of North Texas Regional Collaborative/ <i>Denton</i>
12	●	●	Region 12 Collaborative/ <i>Waco</i>
13	●	●	Region 13 Collaborative/ <i>Austin</i> Capital City Regional Collaborative/ <i>Austin</i> UT MD Anderson Regional Collaborative/ <i>Smithville</i> UT Austin-College of Nat. Sci. Regional Collaborative/ <i>Austin</i>
14	●	●	Region 14 Collaborative/ <i>Abilene</i>
15	●	●	Region 15 Collaborative/ <i>San Angelo</i>
16	●	●	Region 16 Collaborative/ <i>Amarillo</i>
17	●	●	Region 17 Collaborative/ <i>Lubbock</i>
18	●	●	Region 18 Collaborative/ <i>Midland</i>
19	●	●	Region 19 Collaborative/ <i>El Paso</i>
20	●	●	Region 20 Collaborative/ <i>San Antonio</i> OLLU Regional Collaborative/ <i>San Antonio</i>
25	39		

R: Region M: Mathematics S: Science

Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching

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BTIM (Beginning Teacher Induction and Mentoring)

R	M	C	S	INSTITUTIONS
1		●		UT Brownsville/ <i>Brownsville</i>
2		●		Texas State Aquarium-ESC 2/ <i>Corpus Christi</i>
4			●	Galveston County/ <i>Galveston</i> Humble ISD/ <i>Humble</i> University of Houston-Downtown/ <i>Houston</i>
5	●		●	Region 5 ESC/ <i>Beaumont</i>
6		●		Texas A&M University System/ <i>College Station</i>
7		●		Region 7 ESC/ <i>Kilgore</i> UT Tyler/ <i>Tyler</i>
11		●		Region 11 ESC/ <i>Fort Worth</i>
12		●		Region 12 ESC/ <i>Waco</i>
13		●	●	Austin Community College/ <i>Austin</i> Region 13 ESC/ <i>Austin</i> Texas State University/ <i>San Marcos</i> UT Austin - UTeach/ <i>Austin</i> UT Austin - UTeach Institute Expansion/ <i>Texas</i>
14		●		Region 14 ESC/ <i>Abilene</i>
15			●	Region 15 ESC/ <i>San Angelo</i>
18			●	Region 18 ESC/ <i>Midland</i>
20	●	●	●	Region 20 ESC/ <i>San Antonio</i> OLLU/ <i>San Antonio</i>
		23		

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

Mid-Career

R	INSTITUTIONS
6	Texas A&M University System/ <i>College Station</i>
13	Texas State University/ <i>San Marcos</i>

R: Region

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

TRC Partners

State and Federal Partners

Texas Education Agency
U.S. Department of Education
National Science Foundation
Texas Higher Education Coordinating Board
The University of Texas at Austin, SECO

Statewide Corporate and Foundation Partners

Shell, El Paso Corporation, AT&T Foundation
The Cynthia and George Mitchell Foundation

Project Contributors

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