TEXARKANA COLLEGE CONGRESSIONAL FIELD HEARING TESTIMONY

STEM Education in Action: Communities Preparing for Jobs of the Future
September 26, 2011

Opening Remarks and History of Institution

Texarkana College is an institution that has been a vital part of the Texarkana Community since 1927. During this almost century of service, Texarkana College has been the leader in post-secondary education in this area and has been the conduit for so many first time college students to break free from the straps of poverty and achieve something that truly opened doors many thought would never be possible. The role of Texarkana College has been, and continues to be, to provide the path to educational opportunity for a recent high school graduate, laid off worker, or someone that simply wants a better life or a new skill. Texarkana College's motto for the last few years has been that it is, "A Great Place to Start or to Start Over."

TC has a history of leadership, from our faculty to our former and current student body, of excellence in STEM education. "Man in his quest of knowledge and progress is determined and cannot be deterred." "Great tasks are accompanied with great difficulty." These are two of my favorite quotes from our President, John F. Kennedy, from his September 12, 1962 speech entering America into the race to the moon. In that speech, he stated that we must have the courage to overcome obstacles; he stated that we must pursue tasks not because they are easy but because they are hard. Texarkana College was a trailblazer in the fields of Science and Math even before the term "STEM" was ever coined – not because it was easy, but because it has been and continues to be our mission to prepare our students to overcome obstacles and achieve great things.

Collaborations throughout our history have included national partners such as the NASA-funded NOVA (NASA Opportunities for Visionary Academics) Grant and the US Corps of Engineers as well as state and local governments. One of our most well-known graduates, H. Ross Perot, has been a virtual pioneer in STEM developments on the national front. Dr. Mary Witt Hughes, a graduate of TC from the 1930s, was blazing trails for women in science as an orthopedic surgeon. Another graduate, John Tyler, in 1981, was the first person in the world to establish a satellite radio network with his company Satellite Music Network. Today, a current lead engineer for the development of space suits for NASA, Mr. Terry Hill, is an example of another Texarkana native - from a local high school and former 1990's student of Texarkana College - who persevered to overcome barriers to achieve his dream of becoming an aero-space engineer.

Texarkana College was established in 1927 as a public junior college and as a branch of the Texarkana, Texas Public School Systems. The College experienced a slow but steady growth from 109 students in 1927 until the end of World War II at which time it became increasingly apparent that the growth in enrollment caused by returning veterans demanded expansion. Accordingly, a bond issue was included in a 1948 election to the tune of $40,000 to purchase a new campus and to finance construction. Twenty acres were purchased and construction of an administration building

and gymnasium began in 1950. In October of 1951 the college relocated to its present site on Robison Road with an enrollment of 589 students.

Today, Texarkana College (TC) enrolls more than 10,000 individuals annually. The TC Mission Statement reads: Texarkana College prepares individuals for success in life by providing quality opportunities for workforce education and academic advancement. TC is a comprehensive community college located in the border city of Texarkana, TX and offers Associate and Applied Associate Degrees, Distance Education, Dual Credit, Workforce Education, Certificates, and Continuing Education courses. Since 1971, Texarkana College has collaborated with other post-secondary higher education institutions to provide seamless transfer of credit for students. Texas A&M University-Texarkana (TAMU-T) is our community partner and affords students with access to bachelor and graduate degree programs. TC's service areas consist of all of Bowie County, a large portion of Cass County and a small portion of Red River County in Texas. In addition, we are a border county with Miller County in Arkansas and serve these residents as well. TC is an open admission institution located in the twin cities of Texarkana, Texas/Arkansas serving a unique geographic area where four states (Texas, Arkansas, Louisiana, and Oklahoma) meet.

Our student profile is twenty-eight percent economically disadvantaged with seventy-five percent (75%) Caucasian, and twenty-five percent (25%) minorities. Sixty-one percent (61%) of students are younger than twenty-five and sixty-five percent (65%) are female. In FY 2010, 751 degrees and certificates were awarded. Of which 28.8% were awarded to minorities. Approximately sixty percent (60%) were part time enrollees with 40% enrolled full time; approximately 70 % of our student population is enrolled in academic programs while 30% are in workforce education programs. Almost 83 % of our total academic students are employed after graduation and/or go on to pursue a four-year degree. Graduates of our workforce education programs have a slightly higher rate with almost 85% employed and/or enrolled.

Texarkana College has made a commitment in the last two years to establishing a culture of evidence for the entire campus by becoming an Achieving the Dream institution. As we move forward, knowledge gained and information and data shared through this nationwide network of community colleges will be a driving factor in insuring that Texarkana College remains focused on fulfilling its mission: *To prepare individuals for success in life by providing quality opportunities for workforce education and academic advancement.* In May, 2011, Texarkana College was selected as one of the top 120 community colleges in the nation from over 1000 community colleges nationwide to compete in Round 2 of The Aspen Prize for Community College Excellence which seeks to accelerate efforts to improve community college student outcomes and shine a spotlight on community colleges that deliver exceptional student results through the development of high-quality measures and benchmarks for assessing student outcomes. Texarkana College is very proud to have been recognized and included in the Achieving the Dream and Aspen Prize community of institutions nationwide seeking to bring about transformation in community college student success.

Section I: Role of TC in the US economy

Texarkana College has a solid working relationship with Workforce Solutions Northeast Texas, the regional office of the Texas Workforce Commission. Realizing that one of Texarkana College's greatest contributions to our regional economy is preparing a skilled workforce for our employers, the institution strives to promote the attainment of certificates in technical fields that lead to

employment in the local market. TC has proven that historically we have had great success in the award of certificates in technical fields that lead to jobs. TC students from the 2004-2005 graduating cohort receiving a certificate earn an average wage of $32,635. For students who graduated with an Associate's Degree from Texarkana College in 2004-2005, their 2010 Annualized earnings are $38,613.

The college takes an active role in collecting data on labor market training demands by participating and hosting regional planning summits with professionals from the fields of healthcare, advanced manufacturing and technology. The nine-county area served by Workforce Solutions Northeast Texas has a broad and diverse manufacturing base. One of the primary employers in this arena is the Red River Army Depot (RRAD). RRAD is located 18 miles west of Texarkana. The Depot, which was established in1941, repairs, and converts combat/tactical wheeled vehicles and operates the U.S. Department of Defense's only road wheel and track-shoe rebuild manufacturing facility. Many contractors support the work at RRAD including Day & Zimmerman, URS Corporation, Raytheon, M2 Services, BAE, and L-3 Corp. Adjacent to RRAD is the TexAmericas Center. In 1998, the Red River Redevelopment Authority was chartered as a Special Purpose District by the Texas Legislature to transform former military land and buildings into a privately held industrial park. This industrial park is now known as the TexAmericas Center. RRAD and its affiliated tenants at the TexAmericas Center currently employs 5,458 people, including Federal civilian employees (3,403), tenant activities/workers (1,004), active duty military (3), workers employed by contractors (784) and 264 others not elsewhere classified.

TC recently established a19,000 sq. ft. training center at the TexAmericas Center development park. With support from a recent Texas Military Preparedness grant funded through the Texas Governor's Office, this training center specializes in training dislocated and new workers in heavy equipment operation, mechanics, welding, machinery and related skills. Training at this site began in Summer, 2011. The skills being taught at this facility were identified in direct response to employers' request and include: robotics and process automation; instrumentation technology; Programmable Logic Controller; advanced welding/pulse welding; electromechanical, instrumentation and maintenance technologies (multi-craft), solid modeling and design, and integrated systems technology as well as diesel engine and transmission diagnostics and repair. These courses lead to certificates in the specified field and meet regional labor demand.

Texarkana USA serves as the medical technology and health care industry hub for the Ark-La-Tex region. In the 1950s, Texarkana College began the first Associate Degree Nursing program for community colleges in the State of Texas and was later the first community college in the nation to receive National League for Nursing accreditation. TC is a leading producer of highly trained nursing and EMT/Paramedic workforce personnel in the region. The TC Nursing Program has an above-average passing rate of 96% of students taking the Texas Board of Nursing licensure exam for Associate Degree Nursing (RN) and a 93% passing rate for Vocational Nursing students.

Section II: TC Collaborative Partners

PARTNER ENTITY	KEY CONTACT NAME/TITLE AND EMAIL	DESCRIPTION OF PARTNERSHIP
Atlanta High School (TX) Avery High School (TX) Bloomburg H.S. (TX) DeKalb High School (TX) Fouke High School (AR) Hooks High School (TX) James Bowie H.S.(TX) Liberty-Eylau H.S. (TX) Linden-Kildare H. S. (TX) Maud High School (TX) McLeod High School (TX) New Boston H.S. (TX) Pleasant Grove H.S. (TX) Queen City H.S. (TX) Redwater H.S. (TX) Texas High School (TX) Arkansas High School (AR)	Counselor: Audrea Allen aallen@atlist.net Counselor: Brent Jackson brent.jackson@averyisd.net Counselor: Monique Irwin mirwin@bloomburgisd.net Counselor: Lea Dooley lea.dooley@dekalbisd.net Counselor: Mike Mack mmack@fouke.swsc.k12.ar.us Counselor: Chris Fountain fountain@hooksisd.net Counselor: Dru Driver ddriver@simmsisd.net Counselor: Pat Hearn pat.hearn@leisd.net Counselor: Stacey Alexander salexander@lkcisd.net Counselor: Paula Lewis plewis@maud.esc8.net Counselor: Nyla Dowd ndowd@mcleodisd.net Counselor: Paula Turner pturner@nbschools.net Counselor: LouAnne Smith lsmith@pgisd.net Counselor: Jana Scharnberg jscharnberg@qcisd.net Counselor: Hollie Collatt hcollat@redwaterisd.org Counselor: Stephanie Casteel stephanie.casteel@txkisd.net Counselor: Amanda McJunckins amanda.mcjunckins@tasd7.net	These are the K-12 institutions that serve as the primary partnerships
Texas Workforce Commission/ Workforce Solutions NE Texas	Kay O'Dell, kay.odell@twc.state.tx.us Executive Director	Workforce Solutions Northeast Texas provides referrals to our programs and provides training vouchers to eligible students.
Red River Army Depot	Lt. Col. Doyle Lassitter, Commander charles.lassitter@us.army.mil	Training partner and outreach to over 5,000 civilian Depot employees
Christus St. Michael Health Systems Wadley Regional Health System Reunion Nursing Home	Chris Karam, Christus St. Michael CEO chris.karam@christushealth.org Tom Gilbert, Wadley Health Systems CEO tgilbert@wadleyhealth.com	Regional hospitals partner with Texarkana College and provide preceptors for on-site nurse training. In addition, hospital CEOs serve on the College's strategic planning council.
Federal Corrections Institution (FCI)	Michael Carvahal; Warden; mcarvahal@bop.gov Patricia Comstock, Director of Educational Programs; pcomstock@bop.gov	Texarkana College instructors teach on-site at the Federal Correctional Institution to provide certificates in technical fields.
Texas A&M University-Texarkana	Dr. C.B. Rathburn, President Texas A&M University- Texarkana Carlisle.rathburn@tamut.edu	Reverse Transfer of Credit
Tex- Rep Community Theatre (Non Profit)	Vicki Al-Dubais, President Vickie.Al-Dubais@txkisd.net	Enrich and support Texarkana College Theatre Department
Region 8 Education Service Center	Dr. Ray Glynn, Executive Director rglynn@reg8.net	Pre-service teacher preparation

Section III: Barriers to STEM Success/TC Involvement in K-12 STEM Education

To keep a finger on the pulse of the vitally important healthcare industry, Texarkana College has recently participated in two sequential studies to identify variables that have led to a nurse and healthcare shortage in Northeast Texas. It was determined that students are not graduating at a rate sufficient to keep pace with the demand for a skilled workforce. Texarkana College has taken steps to identify students most at-risk and help nursing and health occupation students remain in college and overcome barriers that keep them from persisting. Criteria for identification of at-risk students focused on the following variables: reading comprehension, math scores, Anatomy & Physiology grades, family support, and working more than sixteen hours a week.

Texarkana College has implemented a system to identify "at-risk" in-coming nursing students by asking them to complete a survey to determine methods of intervention to assist them with persistence and completion. Intervention methods include counseling that addressing stress, anxiety, time management, family support, critical thinking, test-taking skills, and lecture class participation strategies. Programs also conducted an intensive one-on-one test remediation for students who failed their first test in the Fundamentals of Nursing course by using the Missildine Exam Diagnostic Tool.

In addition, through our partnership with Texas A&M University-Texarkana, nursing students have access to expanded counseling services to assist with academic, personal, and financial counseling. As a result of the aggressive outreach measures in place through the Health Occupations department at Texarkana College, the Nursing Program has an above-average passing rate of 96% of students taking the Texas Board of Nursing licensure exam for Associate Degree Nursing (RN) and a 93% passing rate for Vocational Nursing students.

As an Achieving the Dream institution, Texarkana College has made the transition to data driven decision making. Programs across the TC campus are using data to evaluate their services or programs and outcomes. Our data showed that one of the areas that hinder student success is the developmental math sequence. In response, the TC math faculty has created three innovative curriculum concepts based on current best practices to prevent students from losing their math momentum - Modular Math, Integrated Intermediate and College Algebra, and Math Boot Camp.

All of these curriculum changes are designed to move students through the sequence more quickly into college credit bearing coursework and toward completion of a degree, certificate or transfer status. One part of the math initiative involves the widespread implementation of collaborative learning techniques and technology. The math initiative will impact all students enrolling in developmental mathematics courses and college level mathematic courses which equates to approximately 2000 or more students annually.

All three mathematics interventions are designed to improve successful completion rates in the developmental math program. Students placing into the developmental math series are less likely than their counterparts to successfully complete a college credit mathematics course or even to persist in college enrollment due to the length of time it may take to complete the developmental math coursework. The data show achievement gaps tied to the following subgroups: ethnicity (African American), Pell, gender (male), age (18-19). However, this intervention targets the academically underprepared student population (based upon their placement into the developmental

math sequence) in its entirety. As a result, the needs of these subgroups will be represented when they fall within the targeted population.

The Mathematics Department and Institutional Research office will assess the effectiveness of these changes through persistence and successful course completion rates for all developmental math courses, College Algebra, and the sequence collectively, disaggregated by standard characteristics, and compare it with baseline data with ongoing treated versus non-treated sections of each course. Also, success rates for Student Learning Outcomes established for each course will be compared in treated versus non-treated sections. In addition, course enrollment rates throughout the implementation process will be tracked for comparison of treated versus non-treated sections. Surveys will be administered each semester in each course to both students and faculty to evaluate the level of satisfaction and engagement in the treated versus non-treated sections. Each semester these data will be shared with key stakeholders to improve the decision making process and ultimately improve and transform student success in mathematics at TC.

Texarkana College contributes to K-12 STEM education in many diverse ways. Three primary contributions are in pre-service teacher preparation, in-service teacher professional development, and sponsorships of student led activities for TC students to collaborate with public schools students and for public school students to compete in cutting edge national events.

TC STEM faculty members are leaders both locally and across the state in pre-service teacher preparation and in-service teacher professional development programs. Key mathematics faculty members from TC have in the past eighteen years served on advisory boards at the state level in establishing guidelines for the mathematical preparation of pre-service elementary, middle and high school teachers and in developing guidelines to improve the STEM preparation of public high school students for college and career readiness.

These math faculty members have received ongoing professional development as statewide trainers for Texas Education Agency approved initiatives in mathematics professional development and incorporated current best practices into the mathematics curriculum at TC, as well as provided professional development in both content development and appropriate pedagogy to in-service teachers across Northeast Texas – actually across the state.

One of our senior math faculty members has twice been selected as a master mathematics trainer for the State of Texas, has collaborated with public school mathematics teachers at all K-12 levels and partnered with the Region 8 Education Service Center to deliver training in best practices in mathematics and science education through the grant funded Texas Regional Collaborative for Science, Mathematics and Technology Excellence. Through this same faculty member, TC has provided grant funded professional development opportunities to area educators in math and science on the application of graphing technology and calculator based laboratories and other hand-held data collection devices. This math faculty member also compiled and co-wrote a high school math curriculum adopted by many school districts across the State of Texas on integrating workforce based agricultural science areas with algebra to improve underperforming student populations' performance on statewide assessments in mathematics.

In addition, Texarkana College partners with the Red River Council of Teachers of Mathematics (a National Council of Teachers of Mathematics bi-state affiliate group) and Texas A&M University-

Texarkana to host on our campus Project STEAM (Successfully Training Educators As Mathematicians) – a regional mathematics professional development conference hosted about every three years since 1994 and serving approximately 450-800 regional educators from K-12, two-year and four-year institutions, along with pre-service educators from participating higher education institutions in Texas and Arkansas.

Furthermore, three senior science faculty members have served as Instructional Team Members for the Texas Regional Collaborative for Science, Mathematics, and Technology Excellence for the past twelve years to lead innovation in classroom practices for area public school science educators in biology, chemistry and physics. Two of those science faculty and the previously mentioned mathematics faculty member were awarded a NASA-funded grant, NOVA (NASA Opportunities for Visionary Academics), to transform the higher education curriculum for pre-service teachers at all levels in math and science to incorporate best practices use of technology in the STEM classroom. These faculty members received opportunities to train at NASA facilities in Houston, TX, and at Cape Canaveral, FL, with other leading scientists and educators around the nation on cutting edge applications of technology. This training was implemented in TC STEM classrooms to help pre-service teachers learn to use technology as an avenue to provide a more realistic opportunity to explore math and science concepts in a hands-on, interactive way – thus allowing students to approach these concepts as mathematicians and scientists would approach them. The long-term impact will be realized in public school classrooms across the region as these teachers graduate and implement innovative teaching practices to engage and inspire students in STEM fields.

Two student led activities in the STEM fields at TC involve the Chemistry Club and Earth Club. The TC 3 Club (Chemistry Club), an affiliate of the American Chemical Society (ACS), has been recognized by the ACS as "Outstanding Chapter" for the last thirteen years. Nationwide, approximately only thirty chapters out of seven hundred receive that special designation from the ACS. The TC Chemistry Club appears in the *In Chemistry Magazine* and the *Chemical and Engineering News*, and has received the "Green Chapter Award" for the last five years - one of only two two-year colleges that have received these awards in recent history. Due to the award winning efforts of the club and its student participation successes, one of its sponsors was made a "Fellow" in the American Chemical Society.

In Summer, 2011, the TC 3 Club participated in the TC Kids College STEM Week activities though exhibits and demonstrations to area twelve to fourteen year old students. The club provides many service activities including water monitoring of the Sulphur River Basin, tutoring, demonstrations at area high schools and for the public through the mall. The Sulphur River Authority was founded in 1985 by an act of the Texas Legislature. Since 1999, our chemistry club students, Dr. Mike Buttram and Patti Harmon, Professors of Chemistry, have tested water in the Sulphur River Basin as either a sub-contractor or contractor for the Sulphur River Basin Authority. These contracts are administered through a contract between the College and Sulphur River Basin Authority. This testing monitors any pollution or discharges in the Sulphur River Basin by private, industrial and governmental entities, which includes the Sulphur River, the tributaries to the Sulphur River, both streams and creeks, and Wright Patman Lake. This contract is for a two year period with a positive cash flow implication of roughly $40,000 annually to the College, which is used for work-ships, scholarships, and internships for our Chemistry students and the purchase of both supplies and equipment for the Chemistry Department.

The TC Earth Club receives recognition annually for the Adopt-a-Highway Texas Department of Transportation project and also for the Texas Stream Team water quality monitoring group. In 2010-2011, they were honored for 20 years of service with an all-expenses-paid trip to Houston, Texas, with accommodations at the Hyatt-NASA, and were asked to present their research to all state monitors, representatives from the EPA and the TCEQ. Locally, the Ark-Tex Council of Governments honors the Earth Club's efforts for environmental projects in the area by purchasing equipment each year for water testing and recycling. In addition, they have been recognized annually by the city of Texarkana, TX for volunteer work. Currently nineteen students are participating in waterway clean-up of the Lake Wright Patman shores on National Public Lands Days in coordination with the US Corp of Engineers. In addition, TC has an Environmental Studies Center and wetland area where students are involved in environmental studies about invasive species, water species, bird watching through Project Feederwatch (a Cornell University project done worldwide) and Frogwatch USA/Texas Amphibian Watch.

In other student led activities, Texarkana College sponsored a group of public schools students, the Bionic Bulldogs, in the 2010 FLL *Body Forward™ Challenge* which explored the cutting-edge world of Biomedical Engineering to discover innovative ways to repair injuries, overcome genetic predispositions, and maximize the body's potential, with the intended purpose of leading happier and healthier lives. The Bionic Bulldogs had call-backs to review their exceptional performances in Teamwork and Project Research in addition to their high Table Performance scores. The TC Bionic Bulldog team was named Qualifying Champion - the highest honor given at the First Lego League Qualifying events. Our team moved forward to the North Texas First Lego League State competition where they competed for the top honors and a chance to attend the World Festival.

Section IV: Percent of TC Students with a Degree in STEM Education

Year	% Graduates with Degree/Certificate in STEM Education	% STEM Graduates-Women	% STEM Graduates – Men	% STEM Graduates – Minorities	% STEM Graduates - Caucasian
2010-2011	51.1%	49.5%	50.5%	26.8%	73.2%
2009-2010	49.8%	52.6%	47.4%	26%	74%
2008-2009	39.8%	46%	54%	23.2%	76.8%
2007-2008	39.5%	51%	49%	20.3%	79.7%

TC provides numerous scholarship opportunities through our Rising Star Scholarship, Presidential Scholarships, Faculty Association Scholarships, and various other endowed scholarships including the Tom Wilbanks Scholarship and the Jake and Bessie Eldridge Scholarship, which allow students to attend their first two years of college primarily cost-free. In the case of the Eldridge Scholarship, outstanding TC students are actually awarded scholarships from TC to continue their education at any Texas public higher education institution. Furthermore, TC partners with many area public high schools to offer dual credit instruction in core curriculum areas including mathematics. Many STEM students pursue both scholarship and dual credit opportunities to advance their educational goals through Texarkana College.

Section V: TC Awareness/Use of Federal Grants

NOVA Grant: In 2000, Texarkana College, through the Division of Physical Science and Mathematics, was awarded the NOVA Grant. Through efforts made by faculty, collaboration with NASA enabled students from local Independent School Districts to benefit from state-of-the-art, technology-based instruction. This grant continued for five years and the results have been a lasting impact on techniques used both at the K-12 level and continuing on to higher education in our area. http://old.texarkanacollege.edu/~mstorey/NOVA/tgazette22300.htm.

U.S. Department of Education:

Direct Programs Include-

- Student Financial Assistance/Federal Supplemental Educational Opportunity Grants
- Federal Work-Study Program
- TRIO- Student Support Services
- TRIO- Talent Search
- Federal Pell Grant Program
- Academic Competiveness Grant

Passed-Through Texas Higher Education Coordinating Board Grants-

- Vocational Education- Basic Grant
- LEAP
- SLEAP
- Byrd Scholarship

U.S. Department of Health and Human Services: Passed-through North East Texas Workforce Solutions:

- Summer Youth Employment- WIA Youth Program
- Child Care Mandatory and Matching Funds

Section VI: TC Transfer & Employment Information

Texarkana College has a 24% transfer rate for FY 2010 to higher education institutions within the State of Texas; however, we have been unable to track transfer rates to higher education institutions in other states which is presumably high for TC due to our border state status. We are joining the National Student Clearinghouse in 2011-2012 to improve a variety of student transfer services including tracking of our total transfer rate. Almost 83 % of our total academic students are employed after graduation and/or go on to pursue a four-year degree. Graduates of our workforce education programs have a slightly higher rate with almost 85% employed and/or enrolled.

Within our community, Texas A&M-Texarkana has been our collaborative partner to provide a seamless transition for students to pursue a four-year bachelor's degree. In 2010, more than 80% of their enrolled students were considered transfer students (TX College Almanac, 2010) of whom we were the primary source.

Articulation agreements are in place with the following institutions of higher education:

•Southern Arkansas University •Texas A&M University-Texarkana •University of Texas- Tyler