My name is Bradley W. Johnson, President of Northeast Texas Community College, here to provide testimony on the contributions of my college to the economy, workforce and community.

Northeast Texas Community College (NTCC) is a small, comprehensive community college located on 400 acres of farmland six miles outside Mount Pleasant, Texas. NTCC has grown by almost 50% in the last three years, to more than 3,400 credit students (35% male; 65% female) this fall. Half the students are preparing to transfer to a university and pursue a baccalaureate degree, while a quarter are preparing for a career in healthcare. The last quarter is preparing for immediate entry to other areas of the workforce, such as automotive technology and culinary arts, law enforcement, computer information technicians, welding and electrical occupations.

Half of the students at NTCC receive a PELL grant and almost 70% receive some kind of financial aid to attend college. The cost to a full time student for tuition and fees is under $1000 (in district) per semester. However, tuition covers less than 20% of the total cost to operate the college. The remaining revenue needs are covered with a local ad valorum tax (currently capped at 10 cents/$100 valuation), state formula funding and other sources.

Northeast Texas Community College serves a student body which is diverse in every imaginable way. Almost a quarter of the students are Hispanic and another 14% are African American. More than 16% of the students come from homes where neither parent graduated from high school and only 20% of the students have a parent who completed a baccalaureate degree. On the other hand, the college serves a number of the top graduates of the region, annually admitting valedictorians/salutatorians and other top performers to its *Presidents Scholar's* program. These and other students regularly participate in regional and national undergraduate research contests and earn distinction in head-to-head competition with public universities from across a five-state region.

The Workforce Development Role of Northeast Texas Community College

Northeast Texas Community College's role is to provide entry-level training and education to persons who are either initially entering the workforce or who are seeking to reenter and retrain in new areas or with updated skills. The college does that through its credit offerings (traditional degrees and certificates), as well as through customized and standardized non-credit offerings.

There are three aspects to the college's workforce development role; 1) bring the literacy levels of aspiring students up to college-level, 2) provide whatever general education is needed for their particular educational goals, and 3) complete the education of students entering terminal degree areas. By meeting this mission, the college improves the marketability of job seekers, productivity of workers, and quality of life for both workers and their families, while reducing the demand on governmental services by those same people.

In a 2010 study of NTCC's role in the regional economy, several measures quantified aspects of the college's economic impact on the eight-county region surrounding Mt. Pleasant, Texas.

1. The Texas tax base expands by about $16.5 million annually as a result of the increased earnings and productivity of NTCC students;
2. State and local governments receive an 8.5% ROI (rate of return) on the direct support they contribute to the college operation;
3. Students receive an 18.9% ROI on their investment in the college (tuition, fees, forgone wages), meaning they earn back 100% of their investment within 7.8 years;
4. The state will avoid $823,800 per year in avoided social costs due to the education of NTCC students. Savings come from improved health, reduced crime, and reduced welfare and unemployment.

These impacts compounded across the nation through the work of thousands of sister institutions; make community colleges a critical player in the US economy.

Northeast Texas Community College contributes to the nation's STEM (Science, Technology, Engineering and Math) fields in several critical ways. First, we are the most likely gateway through which first-generation and economically-disadvantaged students begin their college careers. Although only 10% of our total student body are seeking a STEM degree, these are still significant contributions to the effort.

We also train the technicians required to work within the fields which apply STEM knowledge to American business. Lab technicians, nurses and other medical technicians, industrial technicians, and numerous others are necessary if the innovations arising from science research and development efforts are ever to reach the market they are intended to serve. NTCC has seven health-related programs (844 students) and more than a dozen workforce-related programs (more than 200 students) which provide critical technician-level training to the region and nation. Programs like computer networking and programming provide indispensible support to STEM operations in the educational, research & development, and business arenas.

The college, in partnership with Texas A&M-Texarkana, provides the ability for students to become teachers on the NTCC campus. The Superintendent at one area school district (Mt Vernon ISD) recently reported that, without the teacher education program at NTCC, his school likely would not be able to find teachers. Supplying, and strengthening, the pool of educators is important to STEM efforts, as well.

There has been much discussion among those of us in rural areas about the severe "brain-drain" caused when we educate our best and brightest students through high school, then send them off to the big city for an undergraduate education and never get them back (until perhaps they retire). One of our major area employers, a public utility with a power plant in our region, has noted recently that they strongly prefer employees who grow up in East Texas. According to their personnel director, "we've tried importing skilled workers – they don't stay. We want those who have family and roots here so our workforce investment will return a healthy profit…"

Today this company is our partner in a local industrial technology training program because they have learned their best employees are those with roots in the region, who want to stay in the area and who

therefore have a long-term view of supporting the company's success. NTCC educates students who are far more likely to remain in the region than those who leave for their undergraduate studies.

Collaborations to Create and Maintain an Educated & Skilled Workforce

Northeast Texas Community College partners with every part of our region to accomplish our mission at a fraction of the cost of the private sector, for-profit colleges. Programs like "College Connection" put our students and staff in the high schools, junior highs, and elementary schools of all 11 districts in our region. College Connection assures that every graduating high school student is admitted to the college, or has a post-secondary plan, before they walk across the stage.

The college, through the Communities in Schools program, has staff in most school districts providing case management, social services, and educational interventions to at-risk students. These school districts contribute their own funds, making this program a valuable grassroots collaboration.

In 2010, a regional collaboration called the "Regional Advanced Manufacturing Academy" received state and national awards for its innovations which brought industry-driven training to new and incumbent workers across the entire Northeast Texas region. This collaboration between three community colleges, the regional workforce board, and the Texas Workforce Commission, was managed by NTCC and exceeded all performance standards while earning strong reviews by the companies served.

Despite the 2008 economic downturn, which has been particularly brutal for our region because of our heavy dependence on manufacturing, three partners came together this year to open the Regional Training Academy. This project merges the career and technical training provided by Mount Pleasant Independent School District with the workforce training provided by Northeast Texas Community College in two areas: electrical trades and industrial technology. The result is a state-of-the-art program that serves both high school and adult students in the same facility, with the same instructors, and using the same equipment. By Fall, 2012 all other ISDs in the area will be able to participate in the Academy.

Area industries have identified such a critical labor shortage in these areas that the project (Regional Training Academy) opened its doors in March, six months before the facility was finished. Training occurred in the evening while construction took place during the day. The Industrial Technology program has two cohorts of students in training now, and roughly 50 high school students will join the project this month. Immediate expansion plans include an AutoCAD program, and long-term discussions have begun on the possibility of an engineering technology program with a university partner. All this was accomplished for the cost of $1.5M and in a span of one year. Significant financial and political support came from the Mount Pleasant/Titus County Industrial Development Corporation. This project demonstrates the power of community-based decision making and collaboration.

Challenges to NTCC Students in STEM Subjects

The biggest challenges to Northeast Texas Community College in terms of STEM education lie in three areas: student preparation, student interest, and college resources.

Despite major efforts on the part of our public education system to raise standards and improve student performance in math and science, too many of our students arrive with deficits in their academic

preparation. Thirty-nine (39) percent of our students must take one or more developmental math courses and only 33% of students require no remediation at all.

Too few students choose a STEM major, citing the rigor of the science and math courses or lack of interest in the careers they believe follow such degree choices. Even though one in ten students are following a STEM major, the largest numbers of those students (4% of total student body) are preparing for the healthcare field, leaving too few students pursuing the pure sciences or engineering.

Shrinking college resources create a bottleneck in the lab sciences at Northeast Texas Community College. This fall our lab science courses were filled well before the term began, leaving lists of students hoping to fill slots vacated by withdrawals. The college simply did not have either the faculty or lab classrooms available to open more sections. Lab sciences were offered morning, afternoon and evening until every qualified instructor was teaching, and still we could not meet demand.

With more than $2 million in facility deferred maintenance, the college has no funds to build more classrooms or hire additional science faculty. We replaced one science instructor this past summer but could not afford additional faculty. The college has had to close its Radiologic Sciences program in order to absorb the state funding cuts.

STEM Education at Northeast Texas Community College

Only 2.4% (or 12 students) of the 2010 graduating class at NTCC received STEM degrees. Three-quarters of these were male and two-thirds were minority students. The college is aware of its challenges with graduation and transfer of its students. Graduation rates are better than average for community colleges, far too many students are falling by the wayside. NTCC has recently begun a major rethinking of our entire operation with the focused intention to achieve dramatic future improvements in student success.

Northeast Texas Community College has made considerable efforts in the past to provide opportunities for students interested in STEM career paths. Most recently, for example, our students participated in some of the best STEM experiences in the country:

- Josh Galloway and Alex Best were chosen to participate in the REU (Research Experience for Undergraduates) program at TAMU-Commerce;
- Alex Villalobos participated in Baylor College of Medicine's Summer Undergraduate Research Fellowship Program in Houston, Texas;
- Maria Chavez participated in Boston University's Summer Undergraduate Research Fellowship Program in Boston, Massachusetts;
- Clara Ramirez participated in the Dialysis Clinic, Inc. Collegiate Medical Summer Internship Program in Nashville, Tennessee;
- Alex Villalobos participated as a Research Intern in the Johns Hopkins Asthma and Allergy Center Summer Research Program in Baltimore, Maryland.

This college was the first community college to be approved by Texas A&M University – College Station Biomedical Sciences program for guaranteed admission of our graduates. Students completing their

first two years' studies, following prescribed curriculum, and maintaining superior achievement are guaranteed transfer into this university program. A number of students have graduated successfully from Texas A&M under this preferred admission arrangement.

NTCC's most recent National Science Foundation grant program sought to improve educational outcomes for STEM students and was entitled, "*Mathematics Access for Promising Scholars* (MAPS) *Project."* MAPS was founded to increase the number of minority and underrepresented students with low income who have high ability and the desire to major in a mathematics intensive course of study. The following activities were incorporated to accomplish this goal:

1) Advertisement of the scholarship by instructors and posters,
2) Organization of a campus math/science student organization,
3) Creation of a cohort of students planning to earn an A.S. (Associate in Science degree) in a math intensive course of study,
4) Establishment of direct communication by faculty with selected transfer universities.

Within the MAPS project, the NTCC math and science faculty recruit, mentor, and assemble a cohort of students. Working with their colleagues in the mathematical sciences department of Texas A&M University-Texarkana and Texas A&M University-Commerce our faculty remove barriers for students to transfer to each of these institutions respectively. In particular, an articulation agreement was established in 2008 in Industrial Engineering with Texas A&M University-Commerce. To help students with the transfer process, the NTCC calculus sequence was modified and improved in 2007 to parallel the universities in Texas.

Creating a cohort of students in the mathematical sciences that is closely mentored by dedicated faculty mentors continues to be the most beneficial activity for students majoring in the math-intensive disciplines. The close friendships and support among students prove to be the major reason that students elect to continue the more challenging courses. In addition, academic advisors share information that is important to help students understand the difficulty of the mathematical sciences and the time required to earn a degree in a math-intensive area. Most NTCC students do not understand - nor do their families understand - the difficulty caused by working excessive hours to help pay for college expenses while enrolled in classes in the hard sciences.

MAPS Outcomes since 2002:

- A total of 95 students were awarded the MAPS scholarship;
- Approximately 45% of these recipients were minority students;
- Overall, 74% of the scholarship recipients completed the calculus sequence or were on-track to complete the sequence within a semester;
- 98% of the recipients have credit for Calculus I or above;
- One in three scholarship recipients have earned a B.S. in mathematics or were pursuing the degree at the end of the program;
- Two-thirds (65%) have earned or were on-track to receive an A.S. or above in STEM;
- The overwhelming majority (91%) of the recipients have either graduated with an associate degree or matriculated to a university. NTCC graduation rates overall ranged from 20% to 30% during the time of this program.

Use of Federal Resources by Northeast Texas Community College

Although we have sought a number of National Science Foundation grants in the past, we have been mostly unsuccessful. We understand our challenges to be 1) a lack of experience writing NSF grants which can be highly technical in nature, and 2) a historic preference at the agency for funding research institutions.

We have been more successful working as sub-recipients on grants written by our partner universities. While this has earned our students scholarships and some enhanced learning activities in the past, it is difficult to secure grant funds for labs and equipment when we are a sub-recipient.

One successful effort has focused on STEM recruitment. It was funded through a combination of grants from the Texas Education Agency (TEA) and the US Department of Education. The goal was to inspire interest in Science, Math and Technology among the children of our service district. NTCC implemented *SMART* (Science, Math And Related Technologies) *Girls, The Science Road Show* and *Summer Science Academy* were implemented in February, and conducted throughout the remainder of the school year.

These projects were conducted in the schools of Mount Pleasant Independent School District, Pittsburg Independent School District, Daingerfield-Lone Star Independent School District, Paul Pewitt Consolidated Independent School District, Harts Bluff Independent School District, Chapel Hill Independent School District, and Winfield Independent School District. The *SMART Girls* Conference was held on the Northeast Texas Community College campus. Since the inception of these programs, NTCC has expanded outreach to include hands-on activities targeting boys in middle school, to pique their interest in science, math, technology and pre-engineering with *WISE Guys* (Working In Science and Engineering).

WISE Guys has brought boys to the campus of Northeast Texas Community College campus for week-long academies in the summer to learn about robotics, alternative energy sources, sustainable agriculture and much more. To help meet the growing interest among students, NTCC also implemented *SciFi2* (Science Fun, Instruction and Interaction), workshops for teachers in grades 4 through 6 to help them develop new strategies for presenting science instruction to students. These workshops were sponsored in part by the American Chemical Society (ACS) and offered exciting and engaging activities using low-cost items that teachers could incorporate into their existing curriculum. Other activities, such as *Engineering Your Future* have brought hundreds of students to the campus of NTCC to learn about careers in science, mathematics, engineering and technology, featuring speakers such as NASA engineer Thomas Morrow.

Other examples of NTCC's outreach in the areas of science, math, engineering and technology include offering high school students the opportunity to explore careers in those areas. To do this the college has created opportunities for students to dialogue with professionals from careers in science and engineering, including a NASA Astronaut.

Since 2004, almost 2,000 girls in grades 5-8 have attended a *SMART Girls* Conference and over 4,000 girls have participated in some kind of *SMART Girls* activities throughout the year, with the following demographic breakdown:

- Hispanic 43%
- Asian 36%
- African American 20%

Over 14,000 students have participated in *Science Road Show* Activities. These students had the following demographic makeup:

- Females 52.1% / Males 47.9%
- Hispanic 29.63%
- Asian 0.8%
- African American 17.68%

So far, over 200 girls have participated in *Summer Science Academy* activities and 115 boys have participated in *WISE Guys Academy* activities. *SciFi2* has brought 60 teachers from NTCC service area schools to the campus of NTCC for a 2 day workshop coordinated by NTCC faculty in science and engineering.

Preparing Students to Transfer or Enter Workforce

To enhance the capabilities of our students for success after they leave Northeast Texas Community College, we seek to match or exceed the rigor offered at universities in core curriculum courses, while providing the advantages which come with a small campus – personal relationships with our students which allow for more effective instruction.

There are no universities less than an hour's drive from NTCC. To mitigate that obstacle, NTCC partners to host a University Center on the campus. This Center has full time staff and faculty from Texas A&M University –Texarkana who assist with the transfer process as well as provide the courses on the NTCC campus necessary to complete baccalaureate degrees in Education and Business.

Our advisors regularly work with their university-counterparts so advising can be as accurate as possible and students can complete as many courses at NTCC as will count toward their baccalaureate degrees before they leave us.

Student preparation for the workplace is enhanced because we have personal experience with our major area employers, having toured their facilities and often provided workforce training in partnership with those employers. This assists faculty in bringing the curriculum to students which fits the needs of our regional employers. These local adjustments are most clearly seen in decisions like which versions of software we will teach, the integration of LEAN manufacturing methods into business classes, and the decision to add Level II training to the Industrial Technology program a year sooner than planned.

Thank you for the opportunity to provide testimony to this committee. The challenge to prepare high quality college graduates in sufficient numbers to return the United States to its leadership role on the world economic stage is great and will take all of us working together to be successful.