U.S. Senate Commerce Committee's Subcommittee on Aviation and Space
Building the Space Workforce of the Future: STEM Engagement for 21st Century Education

Testimony by:
Shella Rivano Condino

First, I thank God for allowing me to be part of this STEM endeavor. Second, thanks to all of you for giving me this opportunity today to share and give my testimony about the impact of STEM Engagement especially to the underrepresented, minorities, and rural communities.

I have been a physics educator for 27 years, and I have been an advocate of interdisciplinary and applied approach to learning even before I've heard of the acronym STEM in the late 1990's. I strongly believe in practical and experiential learning, as I myself learn best BY DOING. Who does not enjoy hands-on and minds-on activities? or the adventure of putting theory into practice? or bringing knowledge to life? much more solving real-world problems? The power of this method of learning gives students a sense of responsibility, accountability and ownership in their own learning.

Everyday before I start teaching, I always try reminding myself of this quote: *Tell* me and I *forget*, *teach* me and **I** *may remember*, ***involve*** me and ***I learn***. Honestly, I've always wanted to tell my former teachers about this quote so that they can understand me better when I was a student, but I never got the courage to tell them anyway. So now, this quote has become my daily reminder that as a teacher I need to create a learning environment that is transformative, engaging, fun and where learning remains implicitly.

Teaching in Presidio High School in Presidio, Texas, a border town, rural, geographically isolated and economically disadvantage school, is one of the highlights of my teaching career. I've had my most meaningful and fulfilling experiences as an educator in that school district. The most *challenging*, yet the most *rewarding*. With more than 60% of the students identified as English Language Learners, it truly challenged my creativity in teaching. I used my passion for aviation and aerospace and began incorporating basic rocketry in my physics teaching. I also

created a free summer enrichment program in rocketry and robotics to provide students activities that will make their minds engaged. This idea came to mind when I attended a graduation one year, where 4 empty seats were placed in remembrance of the 4 students who died due to drug related events, drag racing accident and suicide. I felt the urgent need for intervention, a sense of responsibility to the community by keeping these children away from bad elements such drugs, alcohol, teenage pregnancy, and street racing. Hence, I founded the Presidio Rocketry and Robotics Club in 2007 and created teams competing at The American Rocketry Challenge, a STEM initiative, the world's largest model rocketry competition. The program grew membership starting from 3 young girls to more than 30 students! With the support of my co-sponsor Ms. Adelina Portillo, the administrators, staff and teachers, community of Presidio and companies who helped sponsor our program it became popular amongst high school and middle school students. Neighboring rural schools were encouraged and inspired to do the same initiative for their students. Also, Presidio rocketry gained national recognition due to its consistent placement in the top 100 in the nation at TARC since 2009 to present! In 2012, we got invited to the Whitehouse Science Fair and our team presented their rockets to former President Obama. Because we mostly finished in the top 25 in the national finals, Presidio team got the chance to participate at the NASA Student Launch Initiative project, an advanced-high-power rocketry program where students design, build, and launch a rocket which carries scientific or engineering payloads. These aerospace STEM initiatives allowed our students to enhance their critical thinking, analytical and metacognition skills; conduct scientific research, improve their communication skills both oral and written, develop time management and organization, utilize technology through software and simulations, problem-solve and trouble shoot, and collaborate to make wise decisions. Through these programs, my students developed STEM skills and soft skills employers are looking for in the future workplace.

Our students also became involved in the NASA Texas High School Aerospace Scholars program, Texas Alliance for Minorities in Engineering STEM Statewide contest, Texas Tech T-STEM academic competition, Botball Robotics in state and world championships, TCEA Robotics, VEX Robotics, even in the prestigious Zero Robotics Virtual Contest held at MIT! Presidio also participated in the Student Spaceflight Experiments Program SSEP Mission 2 to the ISS, where we

sent a microgravity flight experiment to the International Space Station on SpaceX-1 (Falcon 9 rocket and Dragon spacecraft) and compared results of our own ground Earth experimentations. This achievement is truly special because students collaborated and communicated with the astronauts onboard the ISS, and the community of Presidio developed an awareness and exposure to STEM literacy!

I left Presidio HS in 2014 and relocated in northern VA. However, I continue to mentor the Presidio Rocketry team and communicate with them virtually through Skype every Friday from 3- 5 pm Eastern time. I review their rocket simulations and give them feedback on their designs. I also virtually demonstrate strategies and techniques on how to build stable and robust rocket.

I currently teach AP Physics courses at Oakton High School in Vienna, VA. I continued my goal of encouraging student participation and interest in STEM. I am one of the teacher sponsors of the Cougar Robotics, Rocketry and Physics Clubs. Our rocketry team won first place at the Battle of the Rockets this year, became national finalist at TARC, and currently working with NASA SLI project. Our robotics FRC team made it to the FIRST Robotics World Finals in Detroit, Michigan last year. Last Monday our physics club members participated at the STEM outreach program of the Association of Old Crows in the International Symposium and Convention on Electronic Warfare and won the Cybersecurity Codebreaking Challenge. Last Friday, I took my students to the Projet Aviation Career Education and EXPO in Leesburg, VA and bagged $22500 worth of scholarship on flight trainings.

Because of my experiences in teaching in the 3rd poorest school district in the State of Texas and in the one of the richest counties in the entire country, I became more certain, determine and passionate about contributing to the future workforce. This is my way of giving back to this country. I hope that you too will continue to invest in our youth's education for it will surely guarantee great returns. Thank you very much and may God continue to bless us all and this great country. God bless the United States of America!

Here is a list of a few students who became part of the STEM programs and their current STEM related careers.

1. Ana Nieto – mechanical engineer, Aurora Flight Sciences, a subsidiary of Boeing Company in Manassas, VA
2. Itza Rodriguez – structural design engineer, The Boeing Company in Seattle, WA
3. Antonio Bujanda- mechanical engineer, assistant professor at Texas Tech University in Lubbock, TX
4. Janet Nieto – chemist at Reliable Analysis in Michigan
5. Daniella Barraza – environmental scientist, Bureau of Land Management in Las Cruces, NM
6. Aida and Ana Luevanos – directors, Alumni Relations at Sul Ross University in Alpine, Texas
7. Taylor Galliete – mechanical engineer, Sandia National Laboratories in Albuquerque, NM
8. Helena Cardona – architect, CAS Architects in Mountainview, CA
9. Miguel Nieto – Legislative Assistant, Texas State Capitol House of Representatives in Austin, TX
10. Mextli Delgado- mathematics teacher in Odessa, TX
11. Tatum Galliete – film, Warner Brothers in Los Angeles, CA
12. Roxanne Hernandez – business analyst, Select Energy Services in Austin, TX
13. Matthew LaRosa – physicist, Lockheed Martin Corp Missile Division in Orlando, FL