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VISION STATEMENT: Shaping the Future Through Quality in Education and Professional Development

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A Report on the

U.S. News STEM Solutions: A Leadership Summit

by Belinda Chavez

The particular difficulties our society faces regarding Science, Technology, Engineering and Math (STEM) revolve around the basic question: What is STEM? At the first U.S. News STEM Solutions Summit in Dallas, TX, speakers, panelists, and participants from business, government, and education fields gathered to discuss and share their concerns and efforts toward educating the public on STEM. They focused on how to build on the careers of our students and the urgent need to drastically change the public perception of STEM.

Belinda Chavez and Betty Shanahan at the 100 Women Leaders reception.

Not everyone understands the meaning of the term, STEM. Random interviews of people in a busy city revealed that knowledge of the term STEM was basically limited to students and teachers. While some tried to guess what the term means, the majority of those interviewed simply stated they did not know. This simple interview process illustrates that STEM educators and promoters must actively engage and educate the public about the importance of STEM education to close the skills gap that is adversely affecting the position of the United States as a world leader.

We should change our conversations by speaking of the benefits of STEM education, not just the challenges. Businesses seeking specific skills contingent on STEM education could benefit from a well-educated platform of employee candidates. Building on relationships with businesses will allow students to enter into cooperative arrangements and internships, thereby promoting a skilled workforce at the time of their graduation from college. Students who learn 21st century skills will keep up with rapidly changing media and technology challenges. STEM centers at colleges and universities will help teachers promote STEM and will prepare teachers to teach STEM.

Oddly enough, it is becoming more and more evident that STEM advocates, parents, and teachers, are part of the reason STEM students are changing their career paths, moving away from STEM. The pressure of being "the best and brightest" may be causing students to switch majors and drop out of STEM education because they may not be earning grades at the top of their class. Scholarships with steep scholastic requirements, as well as parents with expectations of all A's and B's may also contribute to the decline of STEM students by exerting performance pressure. Young women in their early STEM education often experience peer pressure from their fellow male students who look upon women more as homemakers, wives, and mothers, than engineers and scientists, thereby causing the female STEM population to drop out of STEM or to change career paths to less technical curricula.

Whether young adults are currently in STEM education or candidates for future STEM education, an emphasis needs to be placed on the importance of STEM education and careers to promote growth and success of our economy, as well as to support students in their trajectory to degree completion.

The education process must begin very early in the lives of our STEM students. Keynote speakers at the STEM Leadership Summit inspired the audience with their stories of struggle and ultimate success. Panelists touted the need for setting examples to show young children if you do "this," you will have "this," e.g., do the math, become an engineer; do the science, become a rocket scientist.

Charlie Bolden, NASA's administrator, spoke about Leland Melvin, the only professional football player who became one of America's astronauts. Even though Melvin lived his dream of being a professional football player, his educational background allowed him to position himself in a successful career as an astronaut. Kareem Abdul-Jabbar also shared how athletes should have a sound education upon which to rely when their

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athletic careers are finished. He cited the less than 400 available jobs as a professional basketball player to more than a million available engineering and technology positions just in the state of Texas. With this comparison, Abdul-Jabbar instilled upon the audience the importance of STEM education as a viable pathway to take athletes, and others, into marketable and realistic careers.

With the rapidly changing technology of software and electronics, it is just as important to promote creativity. Tim Daly, the actor, strongly believes that we must put the arts in STEM creating STEaM to inspire creativity and innovation in the STEM fields. With innovation comes the willingness to accept failure and to learn from these experiences.

According to Bolden, the United States will be launching humans into space within the next five years. Vehicles, launch hardware, and suits are being redesigned and tested, and NASA needs a new generation of STEM experts to work on the design and development of these projects.

Panelists spoke about how FIRST (For Inspiration and Recognition of Science and Technology) places a high importance on leadership while promoting science and technology skills and interests. This group inspires young competitors to use science and technology to solve real-world problems in events such as the FIRST Robotics competition. FIRST is promoted and sponsored by "real world" mentors, engineers, and scientists actively engaged in the workforce who inspire continued scientific conversation.

We must consider the kinds of partnerships necessary to leverage STEM opportunities in general, and in particular for women, who remain underrepresented in STEM fields. During the STEM Leadership Summit breakout sessions, significant statistics were shared concerning young women in Texas and New Mexico. Of the engineer-degreed people in these areas, 50 percent are white men and 18 percent are women of all races. Of the 18 percent women, only 11 percent of those women are in the workforce. These types of statistics were also shared during a recent visit to Mexico when the professors were discussing their dissatisfaction with the number of women engineer graduates versus the very small percentage (less than 11 percent in Mexico) who actually entered the workforce. The cause, they strongly believe, is the culture in a developing country. This major downfall for women STEM students and women engineers exists in many countries, including the United States.

We must create more partnerships between education and businesses to overcome this cultural imbalance through on-the-job training, internships, and cooperative arrangements. These actions will help STEM educators achieve success when striving to increase diversity in the workforce. We must also change pedagogical as well as philosophical approaches in the teaching of STEM to girls and young women and to draw them into the workforce as viable contributors.

During the inaugural STEM Solutions Summit, more than 100 women leaders in STEM were honored. As I watched and listened to nearly 30 women leaders tell their success stories and thank their mentors, I truly felt inspired to initiate purposeful changes in the educational system and to encourage conversations among students that permit them to explore STEM careers and the opportunity to contribute to world improvement through science. But it's more than just the classroom training that makes a STEM graduate successful. The partnership, the mentor, the on-the-job training, the risks taken, and the failures experienced, all of these events build upon each other and complement STEM education to provide successful employees who are innovative, creative, and highly profitable, thereby making vast improvements to our technology, our world, and our future.

About the author

Belinda Chavez is the NASA Safety Center Audits and Assessments Office Operations Manager for Honeywell Technology Solutions, Inc. in support of the NSC Audits, Assessments and Assurance service contract. She is currently a member of ASQ's Board of Directors, the Section Affairs Council Chair, Region 14A Director, and the Education Division Membership Chair. Chavez holds ASQ certifications as a Six Sigma Black Belt and Manager of Quality/Organizational Excellence. She has more than 20 years of safety and quality experience in manufacturing, government, and service organizations in both the Department of Defense and NASA space programs. Chavez can be contacted at chavezb1@peoplepc.com.