

**Nancy Conrad, Founder and Chairman, Conrad Foundation
Written Testimony, September 13, 2011
U.S. House of Representatives Committee on Science, Space, and Technology**

- 1. Please describe in detail the STEM competition(s) your organization leads, including its history, development, participation, parent/teacher involvement, costs associated with the competition and with participation in the competition, and success rates/stories.**

Built on the Legacy of A Pioneer

The Conrad Foundation and its programs are based on the rich legacy of the late Apollo 12 Astronaut and entrepreneur, Charles “Pete” Conrad. The Foundation was created by Pete’s wife, Nancy Conrad, a teacher, education activist and Chairman of the Foundation.

Pete was expelled from a prestigious school in the 11th grade, at which time he couldn’t read and he couldn’t spell. In those days, educators didn’t always recognize dyslexia. His mother took him to a small school where the headmaster saw something special in this young man and took him under his wing. Pete went on to earn a scholarship to Princeton where he became an aeronautical engineer.

He was a test pilot when President Kennedy put out the call for this country to go to the Moon. Pete was accepted to enter NASA’s manned spaceflight program where he flew four missions including Gemini V, Gemini XI, Apollo 12 and Skylab. He was the third man to walk on the Moon and was awarded a Congressional Space Medal of Honor for his rescue of Skylab. Toward the end of his life, Pete was working on the commercialization of spaceflight.

He was pioneer of the past and at the leading edge of the vision of the future. Pete got his moon shot because an educator took him under his wing. Our program is designed to help teachers to take students under their wing, provide mentorship and give students their “Moon Shot”.

Why Our Contest Works

The Conrad Foundation’s Spirit of Innovation Awards (SOIA) presents high school student participants with a very broad challenge: create an innovative product that can be used to address a real-world problem with a real-world solution which can ultimately be viable in the commercial marketplace.

The competition is free of charge to students in the United States and is also open at no cost to international students. These students are given a blank slate within several major categories that can include clean energy, aerospace exploration, and health and nutrition. But they’re not just asked to complete a science project: they are required to conduct research to determine their creation’s potential market impact and develop a full business plan.

Utilizing a network of world-renowned scientists, engineers, academics, and business leaders, the Conrad Foundation connects the student teams with mentors to assist in making their ideas a reality.

A panel of experts selects the top entries to attend the annual Innovation Summit, hosted at NASA-Ames Research Center, where students present their technologies. There, program

participants also have the opportunity to interact in a peer to peer environment, with a slate of guests who have been among the foremost science, business and academic leaders in the world.

Each year several student teams are also chosen to go into the “Portal”, where the Conrad Foundation helps students acquire the patents and funding needed to bring their creations to the open market.

Products of Our Success

Over the course of the past four years of our program engaged more than 1,000 students from a broad socioeconomic demographic nationwide.

Our student teams received technology patents and recognition from government regulatory agencies and the President. They are featured in national and international media including BBC, Fox News, CNN, *Elle Girl*, *MTV Geek*, and *Popular Science*.

Our students are also sought after to serve as speakers at national and international industry and academic conferences such as the International Space Development Conference, AIAA conferences and TEDxSF. There are former student projects now archived in the John F. Kennedy Presidential Library.

A few examples of our exemplary students’ achievements include:

Daniel and Isaac, high school students from Katy, Texas, have two patents on offshore geothermal energy generation system that captures energy using deep sea hydrothermal vents as a heat source. It would use a modular power network to transfer the energy to shore. They been interviewed by the BBC, featured in *Popular Science Magazine* and archived into the Kennedy Presidential Library.

Mikayla and Shannon, high school students from Michigan, created a nutrition bar that meets NASA’s exacting standards for nutrition and stability in microgravity situations. They have been interviewed by *Elle Magazine*, *MTV*, *CNN*, and *Fox*, and have been honored at the White House. Recently their product was flown aboard NASA’s shuttle mission STS-134.

Building on Strong Metrics

To ensure we are meeting our mission of improving the delivery of STEM education to students and providing quality mentorship opportunities, we survey teachers and students at the completion of the SolA. Developed by a former student competitor and a NASA education specialist, the surveys are used to assess the success and value of the program as a tool for project-based learning in STEM education. Across the board, both students and teachers agree that the format provided by the Conrad Foundation enhances and improves student interest in STEM education and STEM career opportunities.

2. Elaborate on the public/private partnerships and initiatives that make the competition a reality, the role of each partner, why an entity chooses to be a partner, and how the partnership is successfully inspiring a future STEM workforce.

Partners Help Students Achieve Their “Moon Shot”

Because our Foundation is built on the legacy of Pete Conrad, the third man to walk on the Moon, our business model for our program is based upon America’s original plan to achieve the

“Moon Shot”. To reach the moon, the U.S. went incrementally, through a rich collaboration of academia, government and industry.

The Foundation mirrors that philosophy by partnering with the best academic, industry and corporate organizations in North America. All our partners recognize the value of investing in STEM education and preparing and nurturing the future workforce of our country.

The Conrad Foundation established three categories with corresponding criteria to define new and current partnerships:

Corporate Partners: We select Corporate Partners for each category that align with our mission and are respected leaders in the category field. This year, these sponsors include Lockheed Martin, PepsiCo and Kraft Foods.

Challenge Partners: Each year we have one official Challenge Partner for each category to provide expert mentors, judges for submissions and post-competition opportunities for students such as speaking at national conferences, internships and career opportunities. Current partners include American Institute of Aeronautics and Astronautics, American Society for Nutrition and the William James Foundation.

Program Supporters: These are organizations or programs that support the Foundation and SoIA year after year. We thank them for promoting our program through their networks and being a great resource for the completion. We put them on our website and invite them to the Innovation Summit. Our primary Program Supporters include NASA, National Institute of Health, Sigma Xi, museums and science centers, *Popular Science Magazine* and Space Ref.

This year, in partnership with the Department of State, we are planning for winning teams to travel to a major international conference on sustainable development to be held in Rio de Janeiro, Brazil, in 2012. Interactions with scientists from around the world will have a lasting impression on the students, whose paths may be toward global science and technology.

3. Expand on the current success of the program/initiative and its contribution to inspire and affect the workforce of tomorrow? What are the biggest challenges and barriers that you face?

Nurturing Tomorrow's Workforce Today

The Spirit of Innovation Awards program reaches all socio-economic levels and ranges from students from the Navajo Nation to Thomas Jefferson High School for Science and Technology, the number one rated school in the country. Our program attracts high school aged students from coast to coast. Roughly one-third of our students are young women, one-third are underserved and one-third are students who enter many competitions.

The Spirit of Innovation Awards is the only competition for teams of high school students combining STEM, innovation, entrepreneurship and education to solve real world challenges. Further, it is one of the only programs that actively collaborates with other STEM organizations. This competition is an open platform, free and available to all socioeconomic levels nationwide.

Our students learn design thinking skills and the system of incremental development from idea to design to reality. This competition isn't about proving how many STEM facts students know. It is about taking everything they know, learning more, and working as a team with their fellow

students, teachers and mentors to create something commercially viable with large-scale social impact. While we help these students understand the importance of what they are learning, they also have the opportunity to innovate and gain recognition at a very early age for their product designs.

As a result of our program, several of our students received patents and media recognition, interacted with government, industry and academic leaders, and gained the opportunity to commercialize their product ideas. We are not only hosting a program, we are driving a movement. We are giving teachers an exciting and dynamic way to teach STEM, and we are growing the young innovators who will sustain our knowledge-based economy.

Addressing Our Challenges

One of the largest hurdles to overcome was developing a way to scale the program in such a way that we can reach a greater number of participants. In order to increase the depth of participation, we identified two simple ways to create a significant amount of improvement in the contest.

- Improve the way we process team applications, which we've accomplished through the implementation of an online judging platform that will be used by our Challenge Partner judges.
- Streamline the application process into a three phase approach which makes the initial ask of the student teams simpler and the overall process easier for the coaches to manage.

However, because we are solely funded through government and philanthropic grants, and individual and corporate donations, our biggest challenge is funding the program so we can scale it to reach mass numbers of students and expand the services and programs associated with the contest.

4. Please describe the effects your competition has on the students who participate and elaborate on any other STEM education-focused activities your organization spearheads.

We have a vision for the 21st century learning environment of student-centered, immersive learning, fueled by collaboration with teachers and public/private organizations. When we set the goal of creating a nation populated with creative student innovators, we knew the end result would be building a future rich in economic diversity, complete with a well prepared workforce and visionary future leaders.

As a result of our program, several of our students have received patents and media recognition, interacted with government, industry and academic leaders, and gained the opportunity to commercialize their product ideas. In addition, we introduce students to new and possibly unconsidered career paths in the STEM industries by giving them unequalled access to mentors and experts in a broad array of specializations. These mentors and partners are guides to college course recommendations, internships and job shadowing opportunities.

We continue to engage our student alumni by encouraging them to serve as mentors and provide peer feedback to current-year teams. These alumni will also help us recruit new competitors in an effort to help grow and expand the contest.

The Conrad Foundation is a firm believer in continuous evaluation to ensure we are meeting the needs of our nation and providing the best quality support to the field of education. While SoIA is our flagship program, as we grow as an organization, we intend to develop additional programs to help support the mission of promoting the value of STEM education nationwide.

5. How can we as a nation spark a greater student interest in math and science education?

The aim of our competition is to ignite America's interest and passion for STEM education. We do this by building relationships in an engaged learning community of students, teachers, mentors, advocates, industry, academia, venture capitalists, government who are excited about the purpose of STEM education.

By committing to this course of action we help students understand that what they are learning has relevance, which has been proven to be a critical element in student engagement of education programs. By expecting students, teachers and mentors to embrace a rigorous program that blends STEM, innovation and entrepreneurship, we are we are growing the young innovators who will sustain our knowledge-based economy.