

EAA Women Soar – Expanding Horizons Space Grant 2011/2012 Special initiatives

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Abstract

Women Soar brings together young women with female mentors who help to expose the participants to math, science, and technology through aviation. Participants have a chance to learn more about programs that can support career goals that have traditionally been male dominated and are able to network with one another to provide support for themselves.

Project Background

Historically the dreams and needs of young girls have been downplayed or ignored in the educational environment. The doors to careers in the fields of math, science, and technology have been much narrower for girls and minority youth due to lack of awareness, encouragement and opportunity. For example, the Federal Aviation Administration's (FAA's) Aeronautical Center reported in December of 2007 that only 6.06% of all pilots in the United States are women. According to a July 2009 publication, Programs and Practices that Work: Preparing Students for Non-Traditional Careers Project, prepared jointly by among others, the Association for Career & Technical Education and the National Women's Law Center, needed techniques to address the lack of women in aviation and non-traditional career fields include: "introducing students to role models, including professionals who have non-traditional careers and peers who participated in non-traditional CTE programs"; and "provide hands-on opportunities for students to learn and apply skills". The report later quantifies the magnitude of the deficit in attracting young girls and women into the fields of math and science by stating, "In fact, the most recent available data show that the level of under-representation of women in CTE fields that are non-traditional for their gender has remained virtually unchanged since 1979. High School girls also continue to be under-represented in critical math and science fields as well. In 2008, girls made up only 31% of students taking AP physics exams and only 17% of students taking AP computer science exams."

The need for continuing and expanding programs like Women Soar is highlighted by a recent study showing that girls in the United States are not significantly more interested in STEM (science technology, engineering, and math) careers than they were 10 or 20 years ago. In fact, those girls who do take an interest in such subjects at the middle school and high school level tend to drift to other interests once in college. The study, Women in Science, Technology, Engineering, and Math, conducted by Florida Gulf Coast University and the University of Colorado at Boulder found that two-thirds of young children (boys and girls alike) said they like

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science, but then the gender differences begin to assert themselves. The diversion away from STEM interest among girls begins to appear in middle school and becomes even more obvious in high school where according to the report, “many girls who take advanced science courses in middle school do not continue to study science in high school”.

Lance Rougeux, Director of the Discovery Educator Network, in Silver Springs, MD, singles out a lack of STEM role models for girls who begin to lose interest in such subjects after finishing middle school. “If I could pick one factor that would make a big difference, it would be the need for formal role models.” He points to the Sally Ride Educator institute as a good example of how female-led STEM groups can attract more girls to technical careers.

Across the nation there are a number of organizations and initiatives, similar to Women Soar, that place an emphasis on building partnerships between schools and the non-profit community. These informal education systems provide programs and experiences that challenge, motivate, and inspire youth, and girls in particular, to seek a higher level of understanding of the concepts of math and science and to consider careers in science and technology. Many school districts do not have the resources they need to develop new curricula for teaching the sciences, mathematics, and other fields of vital importance to helping their students build successful lives. There is also a need to incorporate into the learning environment the development of skills in critical thinking, communication, teamwork, decision making, and problem solving where students often lack these fundamental skills. Students’ likelihood of leading productive and fulfilling lives are much reduced when science, math, technology, and life skills are poorly or inadequately developed. These deficiencies become even more prohibitive, to the point of being crippling, when considering opportunities for women and minorities.

The learning process begins with creating interest, demonstrating opportunity, and providing the resources and networking that can support a changing attitude. Several successful programs similar to Women Soar include (examples from previously cited Programs and Practices That Work):

- The GirlTech program at Francis Tuttle Technology Center in Oklahoma City has significantly increased girls’ exposure to, enrollment in, and pursuit of college degree programs in technology and engineering. GirlTech provides peer and institutional support and guidance for girls preparing to enter traditionally male-dominated fields by pairing girls with professional female role models and building a strong community of girls at the Pre-Engineering Academy and other programs.
- The Seattle Public Schools IGNITE program has, since 2000, connected over 10,000 Seattle high school girls with women currently working in technology careers. The program inspired girls throughout Seattle to overcome barriers to their participation in technology courses by developing personal connections between the girls and their woman mentors. Prior to 2000, girls made up only a handful of students enrolled in Seattle high school technology courses, but after seven years of the IGNITE program, girls made up a substantial number of the students in technology courses and in some cases they filled half the seats in technology classrooms.
- Minneapolis Public Schools launched the High-Tech Girls Society (HTGS) in 2003 to increase the representation of girls in traditionally male-dominated, high tech courses such as aviation, engineering and information technology. The HTGS connected the girls

with women employed in high-tech fields, provided access to professional organizations that support women in high-tech careers and presented opportunities to meet and network with other young women with similar interests in Minneapolis high schools.

These programs prove the worth of early and consistent reinforcement of STEM opportunities for girls and show that an early exposure to technology education and careers can lead to a lifelong commitment to STEM in non-traditional audiences.

Program Goals and Objectives

EAA strives to introduce youth of all backgrounds to the fields of aviation and technology as well as to role models already actively engaged in aviation fields. Aviation provides young people with a great incentive for advanced learning. The opportunity to meet and interact with leaders in the air and space industry can direct future decision-making. Most youth select their careers based on the lifestyles and pursuits of those closest to them, or based on the paths chosen by adult mentors. It is unlikely that a young person would pursue engineering or a similar technological field without having connected with someone already in that profession. This is particularly true of girls.

Women Soar celebrates the achievements of women in the fields of aviation, technology, engineering, science, and other non-traditional careers, and serves to inspire girls to consider and pursue the vast opportunities in these areas. The purpose of Women Soar is to stimulate interest and engage girls in EAA education programs, to introduce them to exciting career opportunities, and to highlight the educational resources available to them. Women Soar also seeks to promote the belief that the sky is the limit, in that it is possible to achieve success in aviation, space and aerospace, science, engineering, technology, and other fields viewed as non-traditional careers for women. The event also brings young girls together with outstanding women presenters who have achieved success and recognition in their fields. These accomplished women can provide guidance, inspiration, and career direction.

The specific goals for the 201 Women Soar initiative will increase knowledge of aerospace and related fields as well as promote interest, recruitment, experience, and training of the next generation of aviation professionals in science, design, and technology where women have been traditionally under-represented. These goals include the following:

- To honor and celebrate the achievements of women in the fields of aviation, science, engineering, technology, and other careers traditionally under-represented by women.
- To acknowledge women's leadership in breaking barriers and opening new pathways.
- To inspire and empower young women and girls in grades 9-12 to seek their dreams and achieve their fullest potential.
- To build a peer network of girls that can provide mutual support during and following the event. Four years ago, Women Soar served as the opening component of an AirVenture focus on women in aviation. The initiative called WomenVenture involved more than 1600 women pilots who signed up during the week to commit their support to helping women and girls find success in the field of aviation.
- To raise scholarship funds for girls to pursue their dreams through the EAA's educational programs. In 2010, \$300,000 in scholarships was awarded to promote the exploration of

technology-based education and experiences such as attendance at the EAA Air Academy in the summer of 2011, or enrollment in EAA Next Step on-line aviation ground school program, or post secondary scholarships.

The above goals are also consistent with NASA objectives in that the investment in human capital will help to ensure that a pool of workers educated in the relevant aerospace technologies and inspired by the field of aviation will be available in the future to advance each of the Directorates' missions. Women Soar will focus its mission, attention and resources on the recruitment, training, and inspiration of the next generation of women innovators, entrepreneurs, scientists, engineers, pilots, and astronauts.

Anticipated Program Outcomes

The anticipated outcomes for the Women Soar program, as designed, were as follows:

- **The formalization of key relationships** – The identification of successful women from all fields of study will become part of a national resource network with which EAA can engage in field and web-delivered opportunities, providing ongoing assistance and direction for girls interested in pursuing education and careers in the fields of aviation and aerospace technology. Young women will also connect with their peers of similar interests, thereby establishing a peer network.
- **Increased awareness** – Young women will be provided with the knowledge, support and direction to pursue opportunities in the fields of technology by utilizing tools such as the Young Eagles website and scholarship funding. Pre- and post-event materials developed by EAA education staff and other education experts will maximize impact of the event's educational activities and challenges.
- **Financial investment** – EAA has demonstrated a commitment to support programs and activities that use aviation as a catalyst to enhance achievement and competency, not only in the core subjects of math and science, but in all subject areas. Targeted approaches that encourage the engagement of girls in aviation and related fields will be successfully demonstrated by their ongoing participation.
- **Educational resource support** – EAA will provide participating girls with a resource package consisting of follow-up educational materials, resources to help advance education and career pursuits, and contact information for ongoing guidance and support.

Results and Findings

Women Soar brought 76 teenage girls between the ages of 13 and 19 together with 20 women mentors, in the fields of aviation, engineering, mathematics, and other science and technology-driven careers. The four-day, three-night event provided activities and challenges that helped form a foundation upon which these young women can base advanced learning and focused educational and career pursuits (Thursday, July 26th, through Sunday, July 29th, 2012).

Activities included team-building using physical challenges, mentoring with dialogue among mentors and peers, and career exploration including a review of the historical advancement of women into non-traditional aviation and aerospace careers. Through a partnership with the University of Wisconsin – Oshkosh, participants interacted with professional career counselors

and science, math and astronomy instructors. They also were engaged with airline pilots, engineers and aircraft mechanics, as well as women currently employed in aviation, including those women who opened doors to those fields for women more than 40 years ago.

Finally, participants participated in EAA AirVenture workshops and forums, and had an opportunity to experience the Advanced Flight Simulator at EAA's AirVenture Museum and a flight in EAA's Ford Trimotor. Time for socializing and networking was provided as well. An awards ceremony at the close of the event reinforced the girls' participation, learning and achievements.

Conclusions

EAA conducts a yearly evaluation of the Women Soar event. Past participants have been very complimentary about the benefits of Women Soar, citing the following outcomes:

- Attendees connected with peers of similar interests, thereby establishing a peer network.
- Attendees become aware of the existence of the current and historical network of successful women from all fields of study.
- Young women gained awareness of and access to the knowledge, support and direction available to support their pursuit of opportunities in the fields of technology and aviation.

EAA has successfully sustained Women Soar since 2005, maintaining the small-group, personalized atmosphere of learning exposure and attention that is designed to attract and retain young women as future devotees and career seekers in the field of flight. The program has had a broad base of sponsors, including: University of Wisconsin – Oshkosh; Women in Aviation International; MIT Alumni Association; Wisconsin Women's Council; Ragged Edge Aviation; and the Antique Airplane Assn. of Colorado. Special thanks and acknowledgement go to the NASA Wisconsin Space Grant Consortium for their generous support of \$3,000 that helped make this annual event possible.