This science teacher from Central New Jersey is ready for a flight lesson as part of her participation in the Take Flight Solutions Workshop. Below right: Group photo from the workshop held June 2011.

Take Flight Solutions

Central Jersey Collaborative Promotes STEM through the Lens of Aviation

"If I can fly an airplane, I can do anything."

by Maxine Scheer

This is a quote from a woman educator who participated in a Take Flight Solutions (TFS) workshop called Leaders Take Flight®. She and the 100 others who have participated in these workshops have gained a new perspective of small airplanes, local airports, and more importantly, themselves. These individuals, who admitted to never having thought of flying in a small airplane, can now associate what it means to be pilot in command (PIC) or to prepare for a maximum performance climb in their own lives. They experienced the rush of actually flying an airplane, and because of the positive effects of learning in an adrenalized environment, were able to retain what they learned years after taking the workshops—a phenomenon TFS has labeled, The Flying Effect™. The research, summarized on the Leaders Take Flight web site, notes that more than 98 percent of the participants have walked away with a more confident perspective of themselves and what they could accomplish.

I came across the TFS initiatives in 2008, while doing research on informal aviation and aerospace education and its relationship to STEM (Science Technology Engineering and Math) education. Having mapped these initiatives amongst dozens of transportation and STEM stakeholders, I realized that many, i.e. thousands, of individuals and groups recognize the motivational aspects of aviation, and are working very hard to engage young people, especially women and minorities, in aviation-themed activities. Most, however, focus on the benefits of becoming a pilot or the promotion of aviation-related careers.

When I read about the Take Flight workshops, they stood out as unique. Instead of promoting aviation for its own sake, the workshops focused on overcoming what inhibited most women from being open to the idea of being able to fly an airplane.

The fundamental aspects of the TFS programs were that if the metaphors and the experience of flying were communicated and demonstrated in terms that could be understood by those with no interest in being pilots, it could be transformative to their lives.

Workshop founders, Linda Fritsche Castner and Sue Stafford, are both general aviation (G.A.) pilots. Linda is part owner of Alexandria Field (N85) in Pittstown, New Jersey, and holds a Master's degree in Exercise Physiology and taught and coached at Bryn Mawr College. Sue is a PhD and is a recently retired professor of Philosophy at Simmons College, an all-women's college in Boston.

"Linda and I are the perfect examples of what we are trying to accomplish with these workshops", says Sue Stafford. "Both of us fly, but neither of us is passionate about flying. What we are passionate about is what the flying experience can do for people, [especially women]."

"You don't have to love flying to benefit from flying" says Linda Castner, "G.A. has far more to offer to the general public than just learning to become a pilot of an airplane—it can teach you how to become PIC of your life."

When interviewing Linda and Sue, they shared their passion on how effective the workshops were, but how difficult it was to garner traction for an aviation-themed leadership course to a general population, apathetic, at best, about aviation and risk averse to signing up for a leadership course that involved flying in a small airplane. We brainstormed about networking with a different audience and eventually connected the dots to the proponents and participants in STEM education.

The challenges that students face in pursuing STEM education or a teacher faces in effectively teaching STEM coursework are very similar to those faced in aviation: Student attrition is high, women tend to represent a small percentage of the total, and exposure needs to happen much earlier and with more

frequency and relevance along the education continuum.

Linda Castner took on the STEM challenge and over the past 18 months, has devoted a full-time effort as the Program Director, initiating and implementing a comprehensive business-education partnership that was awarded a $100,000 Department of Transportation (DOT) grant from the Garrett A. Morgan Technology and Transportation Education Program (GAMTTEP), the first to ever be awarded to an aviation program. The resulting initiative is known as the Central Jersey GAMTTEP Collaborative and was featured as an exhibitor at the 2011 International Women in Aviation Conference.

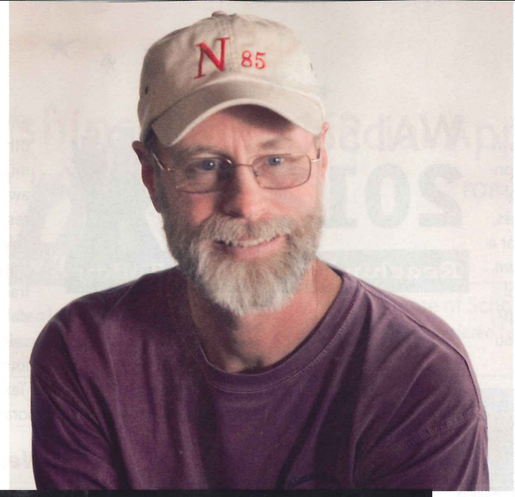
Linda and Sue came to the WAI Conference to tell their story about how their workshops have been transformed into a comprehensive, community-based approach to stimulating and sustaining interest in STEM through the lens of aviation. "This collaborative demonstrates how an airport can become a living laboratory for STEM," says Castner. "We've incorporated into a year-long project, 20 programs ranging from airport tours, a Science Club that meets at the airport and is taking on projects such as aircraft building and planning adaptive reuse of an aircraft, engineering tours and field trips, community outreach, curriculum development, and aviation-themed summer camps. We have also included two of our workshops, one for teachers of STEM, which took place June 23-25, 2011, and the other for high school aged women in August 2011.

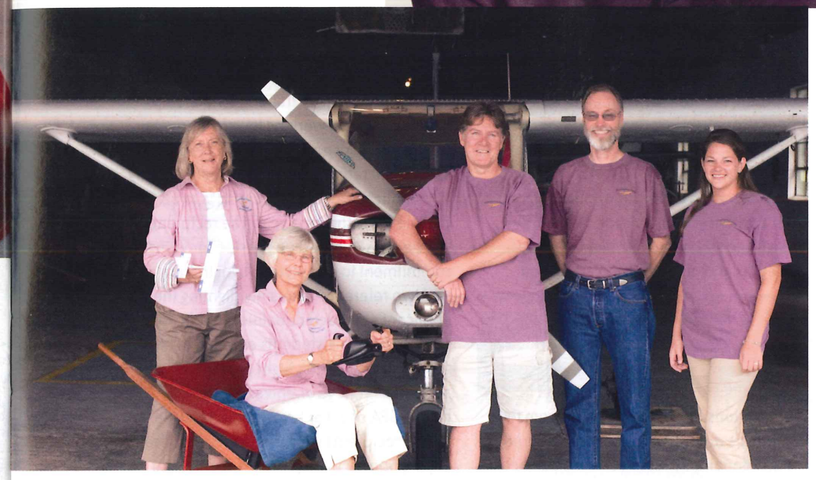
Education partners in this collaborative include not only local schools, but area community and technical colleges, Rutgers University's Office for the Promotion of Women in Science, Engineering and Mathematics and Auburn University, who sent a flight instructor to participate as a Facilitator, as they are considering bringing the workshops to Alabama.

"What I've learned over the past 19 years in running an airport is that most people in aviation underestimate how little the other 99.9 percent know about this industry, especially students and teachers," said Castner. "We also underestimate how most women don't recognize the variety of ways they can use their potential in non-traditional careers. What I see when I go to schools and community events is that most young women don't have a broad enough view of how STEM disciplines can be fun and/or make those connections to their own interests."

In reflecting on the June 2011 workshop for STEM educators, Linda noted that the 12 women quickly understood the basic tools of flying. "It's amazing how much aviation they were able to comprehend after just one hour observing from the back seat, and one hour at the controls. The Flight Facilitators were also amazed at the students' performance after just one hour of ground instruction that included using a $40 wheelbarrow configured to mimic pitch, roll and yaw."

Far Left: Maxine Scheer helped the TFS receive grant monies from the Wolf Aviation Fund. Tahreen Chowdhur is a Physics teacher from Rutgers University, learning a bit of wheelbarrow flying. Right: Rich Stowell is a CFI, founder of SAFE, and staunch supporter of TFS. Below: The workshop staff pause for a group shot.





The Chief Flight Facilitator was Rich Stowell, a nationally recognized Flight Instructor, and former mechanical engineer. "Linda and Sue's concept for the ground instruction did more to prepare students for the first flight than most ground school training. In my emergency maneuver training course, I work with pilots who are fearful and I can see when I get them to the 'other side.' These workshops take ordinary people and push them to do something that is perceived as risky. When the aircraft responded the same way as the wheelbarrow, I saw that same change. At least three of four said 'Wow' as they pitched the nose up."

"The women saw how aviation could be a more interesting subject to teach their coursework and left excited to share this experience with their students," said Castner. "They left proud of what they did, and knew when they looked at a picture of themselves in the cockpit, they would be perceived differently for having taken the risk to learn something new in a completely foreign environment to them."

Stowell also noted the importance of reaching out to that 99.9 percent. "Regardless of whether or not workshop participants go on to being pilots, they will have a different perception of the airport."

"Alexandria Field has always been part of the community," says Castner, "but this collaborative has created a stronger role for the airport and improved our visibility and importance. Through the airport being a living lab for STEM education, we are building a network for teachers and students. Once we launched the GAMTTEP program in 2010, we started to get inquiries from other general aviation airports and from universities who see the potential of this workshop in building leadership and confidence amongst faculty and incoming students pursuing STEM careers."

Another example of how the collaborative attracted interest from STEM programs was an invitation from Johnson & Johnson's Women in Science and Engineering (WISE) to partner for a STEM Exploration Day. "Parents sent us thank you notes surprised at their daughters' interest in aviation," said Jim Gessner, one of the local high school physics teachers participating in the collaborative.

There are nearly 20,000 airports throughout the U.S. including over 1,100 airports like Alexandria Field—privately owned, but open to the public. Many airports host programs that include aviation summer camps, field trips, and women's aviation groups such as The Ninety-Nines, WAI, or Civil Air Patrol.

But if aviation is really looking to improve its image and engage more people, I believe it is worth noting that Take Flight Solutions initiatives, though taking a more "subliminal flight path," may be worth a closer look. They provide a geographic strategy for bringing more aviation and aerospace initiatives to scale and a template for translating an industry filled with talent, givers, and rich STEM concepts, to the needs of a broader audience. ✈

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