

Some insights into FIRST Robotics in Tennessee!

(As published in The Oak Ridger's Historically Speaking column on April 5, 2017)

I know what you are thinking... Just what is "FIRST?" I can hear you now saying, "Now, I have heard of that. It is something to do with robots! I know, it is high school students building robots, but I just can't recall what the acronym means." Hold that thought, we will define it fully in a few paragraphs. It will mean more to you in its proper context.

I have been involved in this amazing phenomenon since being introduced to it by Jim Campbell a few years ago. Jim and I both served on the early Steering Committee. Jim became engaged at the very beginning of the effort in Knoxville and East Tennessee. He brought me along the second year and I immediately volunteered to serve as a judge at the Smoky Mountain Regional competition in addition to serving on the Steering Committee.

Serving as a judge for several years has enabled me to see the competition from a perspective that caused me to encourage support and involvement by Oak Ridge contractors and their employees. I am proud to see that happening more and more.

I truly believe these students are the next generation's leaders in industry. They are amazing! They learn quickly and implement leadership skills most effectively. Just being able to watch them in action is extremely rewarding and significantly increases my confidence in the future of our nation!

The person who was instrumental in bringing robotics competition to us is Mike Wehrenberg. He first saw the effectiveness of FIRST while living in Michigan. Mike has watched the growth spring from 40 teams to now there are over 400 teams in the state. Naturally, when he moved to Tennessee, he thought we could do the same as Michigan. So, I asked Mike to tell us about FIRST from his perspective.

Here is what Mike had to say:

My name is Mike Wehrenberg and I am the VP and General Manager for Kendall Electric, Inc which has eight different locations in east and west Tennessee. Our organization is a wholesale distributor of electrical, automation, and communication goods and services focused in the manufacturing and construction industries.

Over the past 27 years that I've been a part of our company, I continue to hear stories from both manufacturers and from companies that build manufacturing equipment about how hard it is to find the right resources to design, build, operate and maintain production machinery on the plant floor. This lack of resources has even ended up with both manufacturers and machine builders REFUSING customer orders because of a lack of engineering and technical personnel to meet the needs of this new business.

Think about that for a second...a manufacturer or a production equipment builder walked away from new business because of the unavailability of properly trained and skilled resources to design and build (if you're a machine builder) or operate and maintain (if you're a manufacturer) today's production machinery. (That is just sad to have to admit...we can do better! – Ray)

It is that lack of resources that opened my eyes to the weakness that exists in connecting our K-12 students to the world of manufacturing and plant floor machinery. It was apparent that our society had allowed the world of instantaneous communication to create a "disconnect" from USING those powerful communication resources and KNOWING how those types of resources actually are built and operate.

In other words, our K-12 kids know how to use technology but don't have the foundational knowledge and experience of knowing how things work...or how to solve problems...or how to tackle solutions as a team.

This shortcoming had me become involved in the programs that surround the FIRST organization (**For Inspiration and Recognition of Science and Technology**) (See, I told you it would make more sense in context – Ray) almost 15 years ago. FIRST is a nationwide program over 25 years old that brings over 400,000 students together in a team environment throughout most of the school year.

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The teams are presented with challenges to solve in the world of robotics while at the same time working to engage their communities with outreach efforts, create a marketing plan to highlight their team as they work to raise the funds to compete in regional, state, and national competitions across the USA. FIRST presents an environment very similar to a good football or basketball program but focuses on using the mind to solve problems and build strong teams instead of focusing on athletics to accomplish similar goals.

From my efforts with FIRST here in Tennessee, we've been able to host a regional high school competition every spring at the University of Tennessee. This competition has over 35 teams from Tennessee who design and build a 120 pound robot that competes on a 30 feet by 50 feet field of play in two-day collaborative challenge.

This competition is extremely exciting and culminates in both a "field of play" winning alliance as well as a set of teams who win 14 judged awards at the competition. At the end of the two days, six of the 50 teams that compete are invited to the championships with over 400 teams (out of 3,300 nationwide teams) who compete for a "world championship."

Tennessee also has a strong representation of the FIRST Lego League competitive program which is also about solving robotics problems but does so with middle school students and uses the Lego Mindstorm robotics solutions to build a five pound robot from Legos rather than the 120 pound robot built from metal, motors, industrial automation controllers, sensors and other manufacturing components.

In an effort to build on the FIRST program here in Tennessee, I've personally met with the Tennessee Department of Education, with a number of members of our state legislature, with the Commissioner of Economic and Community Development, and with many leaders from the business community as well as schools, students, and mentors.

It is apparent from the enthusiasm and support from all these people that our collective efforts with FIRST are having a huge impact on workforce development and promoting the innovation in manufacturing, science and technology that we so desperately need today.

Please look at www.firstinspires.org or www.tnfirst.org for further information on these successful programs from the FIRST non-profit 501(c)3 organization.

Thank you, Mike!

Maybe that helps you understand what the excitement is all about. The competition on the "field of play" is just the tip of the iceberg. But the competition makes the other important elements of FIRST work. An example is the "Engineering Inspiration" award presented to the Oak Ridge Secret City Wildbots at this last competition which has enabled them to go to the national championships with their entry fee of \$5,000 paid by NASA!

The Engineering Inspiration award celebrates a team's outstanding success in advancing respect and appreciation for engineering and engineers, both within their school as well as their community.

Guidelines for the award are: 1. Extent and inventiveness of the team's efforts to recruit students to engineering with particular emphasis on the most recent year's efforts. Measurable success of those efforts. 2. Extent and effectiveness of the team's community outreach efforts with particular emphasis on the most recent year's efforts. Measurable success of those efforts. 3. A commitment to science and technology education among the team, school, and community. 4. Achievement of the FIRST mission and ability to communicate that at the competition and away from it. And, 5. Efforts are ongoing, not strictly concentrated on the build and competition season.

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The citation accompanying the award presented to the Oak Ridge Secret City Wildbots, included, among several other initiatives, their use of a collaborative effort with Roane State Community College, a "Lab in a Box" that is taken to middle schools in the area. It also mentioned their assistance provided other schools and the obvious enthusiasm they exhibit for engineering.

It was interesting to me to hear the exclamations of joy from the team when the words "Lab in a Box" were read in the citation. They immediately knew they had won the award!

So, where did FIRST originate?

Dean Kamen, with inspiration and assistance from physicist and MIT professor emeritus Woodie Flowers, founded FIRST in 1989. Kamen says that the FIRST competition is the invention he is most proud of, and predicts that the 1 million students who have taken part in the contests so far will be responsible for some significant technological advances in years to come. Ref: Harris, Mark (10 June 2010). "Brain scan: Mr Segway's difficult path". The Economist. Retrieved 2010-06-11.

Dean Kamen is also the inventor of the product, in 2001, that eventually became known as the Segway PT. This is an electric, self-balancing human transporter with a computer-controlled gyroscopic stabilization and control system.

Remember Herman Postma? He was the first person I saw who had a Segway. He used to ride it into the Oak Ridge Breakfast Rotary Club meetings and several of us enjoyed riding it.

So, we can be proud of our Secret City Wildbots, but we also should recognize other surrounding teams who did well in the competition this year. Farragut led an alliance that won the competition on the field of play and Hardin Valley Academy won the Chairman's Award. You can view the video HVA RoHAWKtics used to win the Chairman's Award here: <https://www.youtube.com/watch?v=IN2zJo66xo&feature=youtu.be>

All three of the local area teams are headed to the national competition in Houston, TX!

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Oak Ridge Secret City Wildbots team **Front:** Olivia Mahathy, Ruth Hammond, Kellie Pyle; **Middle:** Dalton Wilson, Connor Shelander, Eric Thornton, Jacob Larose, Tag Groff (student mentor), Eli Charles, Juan Vidal (student mentor), Jessie Pitz; **Back:** Mack Patrick, Luke Buckner (student mentor), Caden Webb, Matthew Martin (alumni)

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Hardin Valley Academy shows off their Chairman's Award banner

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The star of the team, the robot!

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Mike Wehrenberg, our local champion for FIRST Robotics