Connecting classroom curriculum to STEM careers for Florida’s future workforce

2016-2017
AT&T STEM@Work
Year End Report

Final Grant Report Submitted to AT&T
August 2017
By the Consortium of Florida Education Foundations
For the past seven years Florida’s students have benefitted from AT&T STEM@Work!

Since 2010 AT&T has partnered with the Consortium of Florida Education Foundations to support student achievement in STEM areas through $2,000 grants to local education foundations that create real-world, hands-on learning opportunities connecting classroom curriculum in one or more areas of science, technology, engineering and math (STEM) to future career paths.

To date, a total of $685,000 of AT&T funding has had the following impact:

- **300 projects**
- **51,018 students impacted**
- **636 STEM business partners engaged**
- **$1,020,590 total investment (with local match)**

Whether it was launching model rockets, programming robots for competition, or growing vegetables in a hydroponic garden, each project varied depending on the goals and workplace partners involved. AT&T funds were used to provide supplies, equipment and transportation to make each classroom vision a reality.

For the 2016-17 school year, 28 local education foundations accessed the funding to provide creative learning opportunities that have had a measurable impact on student understanding of STEM curriculum and interest in future STEM careers.
In 2016-2017 alone, AT&T STEM@Work impacted:

8,181 Students
8,264 Teachers
102 Local Business Partners
Positive Impact!

• 77% of student participants increased STEM-subject grade by at least a half letter grade

• 71% of student participants showed increased interest in taking STEM classes in the future

• 59% of student participants showed increased interest in pursuing a STEM major

• 53% of student participants showed increased interest in pursuing a STEM career
MAKING IT HAPPEN

The Education Foundation of Alachua County
Stephen Foster Elementary School
Grade 1

80 students impacted
4 teachers participated

Together with Exactech Engineering and UF Project Makeover, we designed and built a Maker Space in our media center. The Maker Space provided students with a work area to design and construct solutions to everyday problems. The grant funds paid for furniture, storage, and materials to stock the Maker Space.

Working with business partners, first grade students designed a shelter for Chicken Little to protect him from the falling sky. Four engineers spent one hour per day in the classroom for five days. The groups started with the story to identify the problem, worked in collaborative groups to draw a possible solution, worked in the maker space to build their designs, and then tested the designs.

The main goal of the project was for students to learn about the engineering design process as a problem-solving method. We also wanted students to show an increase in STEM related subjects and to improve their grades in science. Because the project concluded in the spring and students’ limited time in the Maker Space, outcomes were not applicable but will be tallied in the fall. Professional development on better utilization of the Maker Space will be provided to teachers.
Using OSMO to Reach the COSMOs

Baker County Education Foundation
Macclenny Elementary School
Grades 1-3

600 students impacted
1 teacher participated

The OSMO Kids program took students through the process of coding, working with tangrams, learning to spell and understand the meaning of economic terminology. After being taught basic business knowledge, the students opened their own mock pizzeria, included with the OSMO Computer Coding curriculum. They were required to order supplies, make the pizzas, and sell for a profit. Each student calculated the success of their business and made adjustments for greater profit. Students were introduced to the concepts of business computer literacy as it applies to supply, demand, and profitability. Business partner Bennett’s Feed Store made three visits to our STEM resource classroom. The topic of each visit was: 1) the importance of computer literacy and the use of computer programs in the business world of today; 2) the importance of understanding supply and demand as it relates to a business and its association with profitability; 3) price points and its effect on the profit and success of a business.

- 93% of participating students showed increased interest in taking STEM classes
- 33% of participating students showed increased interest in pursuing a STEM career
- 67% of participating students showed increased interest in pursuing a STEM major
- 85% of participating students increased STEM-subject grade
Engineering a Career

Bay Education Foundation
Jinks Middle School
Grades 6-8

29 students impacted
3 teachers participated

Students participated in an after-school workshop throughout the winter and spring. Applying real-world STEM skills and interacting with engineers/technicians from Gulf Coast Advanced Technology Center, students constructed a “Simon Says” game. In addition to the STEM skills learned and applied, students interacted with professionals and learned about the many STEM careers available locally in the shipbuilding and defense industry.

The teacher described his experience: “This project has made me more comfortable with doing labs in my classroom. Teaching was not my first profession, and being able to have materials and try things with students without having to worry about the grade . . . was an amazing experience. I was able to watch the light bulb go on for so many students when they experienced different levels of success. I feel more comfortable trying things like this . . . now that I have learned more about how to manage the groups and structure the projects.”

- 97% of participating students showed increased interest in taking STEM classes
- 76% of participating students showed increased interest in pursuing a STEM career
- 48% of participating students showed increased interest in pursuing a STEM major
- 41% of participating students increased STEM-subject grade
Adventures in the Classroom with LEGO Robotics

Bradford County Education Foundation
Southside Elementary School
Grades 4-5

40 students impacted
2 teachers participated

The goal of this project was to give elementary students from a low-income area an opportunity for hands-on learning of robotics activities. The program began with lessons on simple programming on the brick, moving single and double motors and building simple vehicles. By the end of the lessons students were able to design and build their own robots with specific problems in mind. Students learned to use precise logical thinking, collect data to make decisions, analyze problems and build collaborative solutions. Utilization of LEGO robotics materials ensured that students were introduced to computational thinking that involves a diverse set of skills, including problem solving, creativity, the ability to explain and to function as part of a team.

Santa Fe College technology staff worked with teachers and students to implement the program and also loaned some of their LEGO materials to facilitate the implementation of the program. The use of college materials and college staff made the students feel proud of the activities they were participating in. It gave them a lot of incentive to continue their interest in robotics education. They saw a "real world" use for the things they were learning.

- 100% of participating students showed increased interest in taking STEM classes
- 93% of participating students showed increased interest in pursuing a STEM career
- 93% of participating students showed increased interest in pursuing a STEM major
- 76% of participating students increased STEM-subject grade
Greased Lightning Robotics - Let’s ROLL: Robotics and Outreach for the Love of Learning

Broward Education Foundation
Cypress Bay High School
Grades 9-12

60 students impacted
1 teacher participated

Let’s ROLL supported hands-on robotics projects and competitions and expanded the number of students who directly participated in the design and programming of robots, and increased the participation of girls. It also provided student-led science outreach activities to elementary students. Students used Spartan robots with outreach programs using a Scratch-like programming language. The Spartans are a simplified robot system that allows students to focus on learning how to code using the input that is provided from sensors. **Modern Robotics** provided an engineering mentor to assist students with construction and programming of robots. The engineer spent two days a week after school assisting with the robotics team, mentoring students in both hardware and software design issues.

- 100% of participating students showed increased interest in taking STEM classes
- 82% of participating students showed increased interest in pursuing a STEM career
- 82% of participating students showed increased interest in pursuing a STEM major
- 67% of participating students increased STEM-subject grade
Students learned about NASA’s space exploration plans which are essential in developing and testing new innovative advances in science and technology. This program provided mentored experiences aligned with student academic pursuits in science and engineering. Students were challenged through participation in local and national competitions where they had to design, build, and test their own rocket. Staff from National Association of Rocketry met with the students during 16 launches throughout the year. They assisted during the launches, and offered tips and advised on best practice routines. During these meetings, there was a very thorough critique of each step in the designing and building of the rocket. A representative from Computer Network Solutions guided the students while building, programming and connecting the electronic bay in the rockets, this included a flight computer, and Arduino to collect information on the rocket experimental payload. Motorola helped the students with 3D printing of the rocket transition pieces.

- 100% of participating students showed increased interest in pursuing a STEM major
- 98% of participating students showed increased interest in taking STEM classes
- 90% of participating students showed increased interest in pursuing a STEM career
- 75% of participating students increased STEM-subject grade
Full STEAM Ahead with 3D Printing

Charlotte Local Education Foundation
Deep Creek Elementary School
Grade 5

115 students impacted
1 teacher participated

This project taught students to develop designs for items they could sell at the school store--iPad stands, bookmarks and key chains—on TinkerCad, online software for 3D designing, and print on 3D printer. We talked about how important the math and design process is with creating a model. Once they had their product in mind, they came up with a plan, complete with a drawing and appropriate measurements. Students were given specific parameters to follow (size, color of filament, etc). They also viewed tutorials on TinkerCad, and watched demonstrations and “how to videos”, so they could get a grasp on how to design from many different sources. This lesson created excitement and allowed students to use math problem-solving skills. Students were intrinsically motivated by the idea of creating their own creations. The lesson also taught students about failure and having to re-design their projects for improvement.

- 20% of participating students showed increased interest in taking STEM classes
- 13% of participating students showed increased interest in pursuing a STEM career
- 13% of participating students showed increased interest in pursuing a STEM major
- 8% of participating students increased STEM-subject grade

Student Quotes:
“I learned how important measurements were.”
“I love printing in 3d. I can create anything that I imagine.”
“I enjoyed learning about the design process and TinkerCad.”
“I love how I have a model of what I created, so I can show my parent!”
STEM in Health and Wellness

Charlotte Local Education Foundation
Port Charlotte High School
Grades 9-12

173 students impacted
2 teachers participated

Students integrated science, technology, and math into lifelong fitness by learning about the major muscles of the body and how to perform exercises to strengthen those muscles using various levels of intensity that were calculated and displayed. Two LCD projectors and ceiling mounts were purchased and used to project assignments, goals, and data created with an electronic spreadsheet on a computer. The students then participated in a progressive strength-training program, which included a week of testing that was developed with the assistance of trainers from CrossFit Murdock. The students were prescribed calculated load assignments based on strength in each of the various lifts. Students were also instructed on how to read food labels, track calories and macronutrients using apps on their phones to keep them engaged and aware of their nutritional input each day which in part helps to create good eating habits to promote lifelong fitness.

- 69% of participating students increased STEM-subject grade
- 11% of participating students showed increased interest in taking STEM classes
- 10% of participating students showed increased interest in pursuing a STEM career
- 9% of participating students showed increased interest in pursuing a STEM major

Student Quotes:
“I learned a lot about anatomy and how the human body works.” – J. Menendez
“I was very inspired to pursue a health-related career after listening to the coaches from CrossFit Murdock. I plan on becoming a personal trainer where I can help people become healthier and more fit.” – J. Jensen
"I need to put my finger on it"

Champions for Learning (Collier County)
Cypress Palm Middle School
Grade 6

20 students impacted
1 teacher participated

The main objective of this project was to give students a hands-on look into STEM careers that involve the engineering process and how those careers can help people with injuries and disabilities. Students learned the engineering process, researched various STEM careers and learned about how one STEM career, biomedical engineering and manufacturing helps people lead fully functional lives after major injuries. Our business partner from Arthrex gave the students a presentation about the products his company creates using a 3D printer. He explained the functions the products serve in connection to biomedical engineering and how they are constructed. This demonstrated the application between what they had previously learned and how it is applied in the real world. It also allowed them to connect with the professional and be inspired by his knowledge and experience.

In creating, customizing, and manufacturing their own finger cast, students had to use their math skills of measurement conversion to fit their finger and coordinate grids during transference to the printer. Through this process they utilized teamwork skills, improved knowledge of math skills, and produced a product that had meaning to them.

- 100% of participating students increased STEM-subject grade
- 45% of participating students showed increased interest in taking STEM classes
- 80% of participating students showed increased interest in pursuing a STEM career
- 65% of participating students showed increased interest in pursuing a STEM major

Project Video:
https://youtu.be/iA9u2RlCql0
BTMS Eagles are Biomass and Bioproduct Engineers

Flagler County Education Foundation
Buddy Taylor Middle School
Grades 7-8

500 students impacted
2 teachers participated

This project was an extension of a growing partnership with Penn State University, Ernst Seed Company, UF IFAS and the Buddy Taylor Middle School STEM, Agriscience classes and 4H and FFA clubs. The purpose of this project was to educate middle school students on the issues of sustainability, climate change and the amount of biomass needed to replace what it used in terms of fossil fuel consumption by creating an extremely concrete example that the students are a part of from the start of the project. The students planted a plot of switchgrass, walking the field during establishment, pulling weeds and tracking growth, then they made bioethanol from shredding of switchgrass and the leftover biomass material was pelletized to make a biomass bioproduct. The making of switchgrass pellets also allowed students to plan, create a marketing strategy and then sell the pellets, which are naturally, very moisture absorbent. The amount of work students put into the project, from establishment to just short of production, has given them an appreciation of how much work is put into the production of alternative fuels.

- 25% of participating students showed increased interest in taking STEM classes
- 20% of participating students showed increased interest in pursuing a STEM career
- 16% of participating students increased STEM-subject grade
- 15% of participating students showed increased interest in pursuing a STEM major
The Magic of 3-D Printing and Forensic Science

Glades Education Foundation
Moore Haven Middle-High School
Grades 9-11

65 students impacted
1 teacher participated

This project brought the “magic” of 3D printing, the latest technology to impact forensics and the field of medicine to the classroom. Until recently, this technology was not universally available to students. The class partnered with Florida SouthWestern State College and Florida Department of Law Enforcement to introduce students to its use. FSW and FDLE provided students with speakers, tours of a forensics classes and labs and meetings with forensic instructor. Students were able to interrelate the knowledge gained to this new technology. Students were also introduced to the requirements for careers involving 3D technology such as forensics, crime scene investigation and possible medical arenas. Students then applied the concepts of 3D priming in the classroom by actually using a 3D printer pre-loaded with STEM software. Additionally, students were shown how the use of 3D printing could become a profitable business.

- 63% of participating students showed increased interest in pursuing a STEM major
- 48% of participating students showed increased interest in pursuing a STEM career
- 43% of participating students increased STEM-subject grade
- 31% of participating students showed increased interest in taking STEM classes
Step Up to Stem

Glades Education Foundation
Moore Haven Elementary School
Grades 2-5

310 students impacted
1 teacher participated

Community health partners—Glades County Health Department and John Hopkins Hospital—worked directly with students focusing on problem-solving and application of STEM technology, science, math, and health skills. Students integrated technology, science, health, and math into physical education by using uploadable pedometers and learned about moderate to vigorous physical activity. The connection of real-world relevance to classroom curriculum along with the technology of the pedometers fostered an active learning environment. Students, parents, administrators, and the teacher were able to assess how the students were doing in class. Students used data to help them foster a more active lifestyle. The project helped students understand how STEM careers help foster a better lifestyle.

- 33% of participating students showed increased interest in pursuing a STEM career
- 21% of participating students showed increased interest in pursuing a STEM major
- 16% of participating students increased STEM-subject grade
- 15% of participating students showed increased interest in taking STEM classes
Students were presented with a request from the West Hernando Middle School Green Team to develop an area of school with the intent of increasing biodiversity on campus by providing suitable habitats for native butterflies and their larvae. The problem-solving they engaged in included reading informational text regarding declining butterfly populations, researching and recording adult and larvae food plants that were conserving and/or native to Hernando County and butterflies native to this area. Students also completed a landscape plan that included soil testing and observations of light/shaded areas, measured and mapped the garden to scale, and planted flowers and spread mulch. Recognizing a need to improve habitat for butterfly populations, the WHMS environmental students worked together to research the global and local problem of declining butterfly populations, possible correlation of human interactions, and natural events. Students then presented their research to business partner Dynamic Auto Body and to the school advisory council. Students also measured, mapped, researched, designed, and planted an area on their campus in order to create a butterfly habitat, which incorporated reading, mathematics, and science concepts.

- 81% of participating students showed increased interest in pursuing a STEM major
- 81% of participating students showed increased interest in taking STEM classes
- 73% of participating students showed increased interest in pursuing a STEM career
- 32% of participating students increased STEM-subject grade
This project supported the Hillsborough Regional STEM Fair, the largest academic competition in Hillsborough County. AT&T funds afforded students and teachers the opportunity to work directly with engineering firms, an advanced manufacturing center, and the local offices and research laboratory of a national biotechnology company to improve their work and communicative abilities in describing their own research. In addition to working directly with students on STEM-related topics, a secondary goal was to provide students with the opportunity to learn about STEM careers in engineering, advanced manufacturing/robotics, communications, and biotechnology.

All students who competed in STEM Fair had opportunities to shadow employees at sponsor’s businesses to learn about STEM careers. One business partner, Bristol-Myers Squibb, supported 24 students throughout the State of Florida Science and Engineering Fair. These students were invited to Bristol-Myers Squibb offices to shadow employees and learn about STEM careers as well as received critiques on their STEM Fair project presentations. In part through this guidance and mentoring, one student was selected to represent Florida in the 2017 Intel International Science and Engineering Fair. Other business partners included: Stantec, TECO, AFCEA, AON, Florida Hospital, Mosaic, Suncoast Credit Union, USAA, Doosan, Gerdau, Nielsen, City of Tampa Water Department, Lockheed Martin, Prida Guida & Company, The Institute for Advanced Discovery & Innovation, and T. Rowe Price.

- 96% of participating students showed increased interest in taking STEM classes
- 92% of participating students showed increased interest in pursuing a STEM major
- 75% of participating students showed increased interest in pursuing a STEM career
- 25% of participating students increased STEM-subject grade
Engineering Our Future was designed to connect students to STEM today and in the future by exposing them and engaging them in real world science. The students were exposed to situations in which they had to use diagnostic skills when addressing problems - from word problems to the hands-on practice with local business partners utilizing the materials that were procured with grant funding. For example, a local mechanic used a model of a small engine and explained to students what steps a mechanic takes to determine the source of engine trouble. The students went on a field trip to Lake Technical College where students in the nursing program used a human anatomy model to explain the steps a nurse takes to assess the source of someone's illness. Representatives from Electron Machine Corporation visited students to discuss their products and how they impact the market as a whole as well as focused on the importance of STEM in their industry. One staff member highlighted a piece of equipment called the MPR E-Scan Refractometer. He explained in depth how the equipment worked and how it is used in the paper, chemical and food industries. Students were intrigued by how simple a very complex piece of machinery can be when the mechanics are explained to them. The students were very engaging and they all wanted to touch the equipment to get a feel for how it worked. The project positively impacted the students as they seemed to be much more interested in the STEM field when they realize the endless possibilities that are available in this field.

- 100% of participating students showed increased interest in taking STEM classes
- 75% of students increased STEM-subject
- 62% of participating students showed increased interest in pursuing a STEM major
- 62% of participating students showed increased interest in pursuing a STEM career
Win a Tablet - STEM@Work Presentations

The Foundation for Lee County Public Schools
All District High Schools
Grades 9-12

300 students impacted
13 teachers participated

Students participated in numerous, hands-on STEM@Work experiences at local businesses throughout the school year. The goal was to expose students to STEM-related fields in order to build their awareness and offer local industry opportunities that develop talented students entering the workforce. Students worked in groups outside of the STEM@Work experiences to develop a presentation demonstrating what they learned, what interested them the most, what new interests resulted from their involvement in this program, and what they plan to do with this knowledge and interest in their immediate future (i.e. classes, internships, college or technical program research, etc.). Students gave their presentations at a STEM@Work Wrap-up where they were judged by business partners from: SWFL International Airport; Florida Gulf Coast University; B&I Contractors; Covanta Energy; CenturyLink; Chico's; CROW - Clinic for the Rehabilitation of Wildlife; Ding Darling National Wildlife Refuge; Goodwill Industries of SWFL; LeeSar; LCEC; Gulf Coast Medical Center; Cape Coral Hospital; News-Press Media Group; NBC/ABC/ Waterman Broadcasting; Spiro & Associates; SWFL Public Service Academy; Mermaid Manufacturing/ MediKool; S4J; Storm Smart; Wear The Fund; Trilogy Laboratories; and Marine Concepts. The winning groups won laptop computers and the runner up groups won tablets.

- 83% of participating students showed increased interest in taking STEM classes
- 83% of participating students showed increased interest in pursuing a STEM major
- 83% of participating students showed increased interest in pursuing a STEM career
The overall goal of this project was to address the needs of high-level learners who have a high aptitude and interest in STEM. This was achieved by giving these students the opportunity to participate in afterschool robotics clubs with STEM objectives. Students used critical and complex thinking skills to define problems, evaluate alternatives, develop plans of action, and troubleshoot as an on-going progress. They built and programmed robotic systems and used creative thinking skills to generate new ideas. Students worked together in small groups using their strengths to solve real world problems. Groups of students had to troubleshoot when the robot did not work and each group embellished their robot systems to improve and change the design, sometimes to do different tasks than originally intended. It was very motivating for the students. Even if they didn’t succeed right away, each group was anxious and excited to see their robot work! Students from Florida State University came out to the school during the STEM club to present some STEM activities with the students. They emphasized working together in groups to do problem solving.

- 37% of participating students showed increased interest in pursuing a STEM career
- 40% of participating students showed increased interest in pursuing a STEM major
- 91% of participating students showed increased interest in taking STEM classes
- 11% of participating students increased STEM-subject grade
**Build a pi3, Create a Learner**

Manatee Education Foundation  
Louise R. Johnson Middle School of International Studies  
Grades 6-8

22 students impacted  
1 teacher participated

This student-led project was conceived after researching that a zero-power supply system could potentially provide adequate, accessible, and free power to a third world country. Students worked with business partner **Kids Inspire Kids** on programming and assembling raspberry pis that provide stand-alone energy for batteries. Once the pis were assembled and programmed, students worked with the Goal Zero Solar Generator to determine the best configuration to power raspberry pis with different sized monitors. Once a baseline was established, students tested the capacity of the batteries including how long it would take to charge in different conditions. Our business partner is traveling to Africa this summer and is taking 28 raspberry pis, 12 monitors, and the solar generator to use with the kids in Africa. He will send pictures so the students can see the result of their work. Overall, the students did not realize they were learning; they were just helping kids not as fortunate as them get some of the things they take for granted.

- 68% of participating students showed increased interest in taking STEM classes  
- 50% of participating students showed increased interest in pursuing a STEM major  
- 45% of participating students showed increased interest in pursuing a STEM career
Students enrolled in Agriscience applied scientific and technological principles to produce fresh cilantro, basil, radishes and lettuce hydroponically under two different environments: indoor and outdoor, full sun. Students implemented the scientific method and science process skills using RockWool and Oasis cubes to start seeds. All students assisted in planting one or both the indoor and outdoor systems. They engaged in pH measurements and mixing ratios to determine the proper amount of fertilizers to use in the hydroponic systems. Students measured and compared indoor and outdoor growth habits and had a “salad party” to sample the produce they had grown. Our GrowTower business partner stayed in contact to provide feedback throughout the project and conducted site visits toward the end of growing. A manager from another hydroponic farm visited morning classes and used electronic pH and conductivity meters to analyze the outdoor hydroponic system and discussed how pH impacts nutrient uptake of plants. A wholesale greenhouse producer visited and students gave him a short tour of their systems and a local producer conducted a site visit in response to this program’s aquaponics component. The CEO of JR Peters Laboratory offered to analyze tissue samples for nutrient contents from our hydroponic systems so that students could compare the methods. To this effort, two class periods assisted with leaf collection and sealing them to mail. The Executive Director from SeedYourFuture made contact to see what a middle-school agricultural program looks like and visited two class periods. Students led her on tours of their hydroponics and raised bed gardens.

- 60% of participating students showed increased interest in taking STEM classes
- 55% of participating students showed increased interest in pursuing a STEM major
- 46% of participating students showed increased interest in pursuing a STEM career
Laser Engraving on the Curve!

Manatee Education Foundation
Braden River High School
Grades 9-12

600 students impacted
3 teachers participated

Through this project students explored manufacturing engineering through state-of-the-art learning opportunities integrating math, science and technology preparing them for post-secondary education and work in the field by learning to engrave stainless steel tumblers. With the help of our business partner RCH Enterprises students were able to set-up templates and parameters that allowed the mass production of mugs while also making one-of-a-kind personal items. Students learned how settings on the laser worked and tested the speed, power, and PPI (pulses per inch) to find the perfect setting to engrave. Students also researched many different brands of tumblers and were able to measure, adjust their templates and engrave successfully. Learning about the finishes and coating on the tumblers helped them better understand material processes.

- 85% of participating students showed increased interest in taking STEM classes
- 80% of participating students showed increased interest in pursuing a STEM major
- 75% of participating students showed increased interest in pursuing a STEM career
- 75% of participating students improved STEM-subject grade
Growing the Future- a 21st Century Community Garden

Public Education Foundation of Marion County
Horizon Academy at Marion Oaks
Grades 5-8

120 students impacted
5 teachers participated

Using the engineering design process, students worked with Verti-Gro to layout, plan, design and construct a 30-tower vertical hydroponic recirculating garden and greenhouse that uses affluent from our aquaponics program for nutrients and captured rainwater. This has enabled them to grow individual crops and harvest healthy, organic, pesticide free vegetables and fruits to take home for family use. Students learned AutoCAD to design the hydroponic system and greenhouse and researched rainfall data trying to understand the impact this system could have on water conservation efforts. They also developed a plan for a student-run farmer’s market to sell any excess produce to raise money for seed and media purchases with the goal of becoming self-sufficient.

This project, located at a school in a low-income, high-crime neighborhood, supports a much needed, quality after school STEM-based program that addresses both student and community needs, allowing for safe, fun activities that promote small business, entrepreneurship and student-developed STEM projects.

• 89% of participating students showed increased interest in taking STEM classes
• 67% of participating students showed increased interest in pursuing a STEM career
• 31% of participating students showed increased interest in pursuing a STEM major

**above outcome data from 2015-16 efforts; current year outcomes not yet available**
Enhancing Life through Product Design

Okaloosa Public Schools Foundation
Niceville High School
Grades 9-12

200 students impacted
1 teacher participated

Students worked in teams and used Lean Six Sigma concepts of team building and process improvement to research and develop a product or improve on one that improves everyday human life. Students took their ideas to their respective "home" schools where their classmates voted on the project(s) most likely to be purchased. Once an idea was approved, the responsible student then sketched the product in a 3D program for printing. In completing this project, the teacher found that he was able to increase the students' abilities in Solidworks, which brought them closer to earning industry-recognized certificates. The business partners Gulf Power and DCJAEGER were instrumental to the success of this program as they provided the required tools and resources to print projects.

- 38% of participating students improved STEM-subject grade
- 25% of participating students showed increased interest in taking STEM classes
- 5% of participating students showed increased interest in pursuing a STEM major
- 5% of participating students showed increased interest in pursuing a STEM career
Elementary Students Learn About STEM Careers Through a Mission to Mars

Education Foundation of Palm Beach County
Poinciana STEM Elementary School
Grades K-5

563 students impacted
1 teacher participated

The Mission to Mars program taught students a multitude of lessons on life in space as part of the curriculum on Earth Space standards. The eight-month long project helped the students grasp important STEM aspects of gravity, energy, life on Mars, the International Space Station and a variety of other topics. Throughout the project students worked together to create their own Mission to Mars, and digital media students from Dreyfoos (High) School of the Arts captured the K-5 benchmarks as part of their own semester long projects. Business partners from Pasco Scientific, PB State and Lockheed Martin were an active part of the process when they joined in the Planetarium and shared real-life stories of careers in the STEM fields. With the guidance of STEM professionals, students collaborated to cross-cut the Kindergarten through 5th grade STEM standards to create a journey through space. Having STEM professionals provide input and knowledge helped us understand the possibilities of future careers to work toward.

- 90% of participating students showed increased interest in taking STEM classes
- 80% of participating students showed increased interest in pursuing a STEM major
- 80% of participating students showed increased interest in pursuing a STEM career
FIRST Robotics Competition (FRC) Team

Pasco Education Foundation
River Ridge High School
Grades 8-12

32 students impacted
2 teachers participated

This project supported high schoolers in their First Robotics Competition, building and programming a human-sized robot to complete a certain task while learning what is involved in manufacturing, medical and business partners from Universal Labeling Systems guided students in designing, building and programming an exceptionally complex robot for the 2017 FIRST Robotics Competition Season. The robot featured a system to pick up and place 12-in diameter gear-shaped game pieces and a fully automated turret to shoot 5-in diameter balls into a goal eight-feet above the ground at an average rate of five balls per second. Additional partners were invited to come observe the students’ progress and talk about the desired skills in today’s workplace. They provided insight into the needs of their own business and how the projects correlate to real work experience and connection to various job opportunities. Students were informed about the appropriate coursework for a STEM career path.

- 100% of participating students showed increased interest in taking STEM classes
- 100% of participating students showed increased interest in pursuing a STEM major
- 100% of participating students showed increased interest in pursuing a STEM career
- 100% of participating students improved STEM-subject grade
This project provided students with a real-world environment for developing software products while working with business mentors. Through several workshops students worked closely with business partners from Resolution Management exposing students to project management, business analysis, design, architecture and the diverse career opportunities within the technology industry. Project-based learning focused on solutions to real-world challenges taught by seasoned professionals. In total, twelve teams from eight high schools were selected by judges to pursue their product. Daily communication on Basecamp allowed students to gain valuable insight on design production with their business mentor. Teachers were also able to understand the unique problems/questions students were facing and gain invaluable knowledge from the business mentors. Basecamp provided a web-based solution were all teams maintained product documentation and presentations. This unique management tool allowed teachers, students and business partners/mentors a forum for collaboration beyond workshops. Students appreciated business partner being truthful with feedback, letting students know it is alright to fail and turning that into a learning experience, providing insight beyond what is learned out of a book, and understanding various job opportunities. Business partners were impressed with student dedication, knowledge and willingness to learn.

- 10% of participating students showed increased interest in taking STEM classes
- 8% of participating students showed increased interest in pursuing a STEM major
- 5% of participating students showed increased interest in pursuing a STEM career
Amphibians, Reptiles and Birds, Oh My!

Polk Education Foundation
Chain of Lakes Elementary School
Grade 1

40 students impacted
2 teachers participated

The goal of this project was to transform students into wildlife biologists who marvel at the wonders of the natural world, look closely at the habitat around them and work to protect the natural environment. This was achieved through hands-on interactive science experiences including a series of discovery hikes around the school campus. Each hike focused on a different environmental science topic: trees, plants, vertebrates, invertebrates, amphibians, reptiles, mammals, and birds. Great teachers know that it’s not what you teach, it’s how you teach it -- and so they used each topic as a springboard into developing higher-order thinking skills, challenging paradigms, and encouraging students to think outside the box. These hikes were led by our business partner Kleinfelder with the underlying purpose of identifying animal and plant species and learning what steps first graders can take to be positive agents of change. High school students facilitated stations, helping students dig a little deeper into environmental studies. This was great exposure for the older kids to teach what they know and for the first graders to have the opportunity to extend their knowledge of the environment in a different setting.

- 78% of participating students showed increased interest in pursuing a STEM major
- 78% of participating students showed increased interest in pursuing a STEM career
- 75% of participating students improved STEM-subject grade
- 58% of participating students showed increased interest in taking STEM classes

“It really enhanced my science lessons and engaged the students much more than I could have imagined. As a result … I’m more comfortable teaching science and am excited to learn alongside the students.” —Heather Davis, 1st grade teacher
Project Fab Year 1 - Engineering for Agriculture

Polk Education Foundation
Winston Elementary School
Grades K, 4-5

86 students impacted
6 teachers participated

The objective of the 'chicken coup project' was to create a project-based learning opportunity allowing students to take part in all parts of the Inquiry Cycle that the school incorporates into STEM-based curriculum. Fifth grade students were presented with a real-world problem and had to brainstorm, design, and present in front of their peers (as well as teachers/staff) a sustainable and economic solution to the Academy’s growing chicken population, integrating fabrication tools and materials. Students worked on the construction, fabrication and 3D printing of the chicken coup, chicken toys, and vinyl printing of signs for the project. Kindergarten students incubated chicken eggs in their five classrooms to birth the next generation of inhabitants for the coup. Representatives from business partners Miller Works and Phillips and Jordan Construction visited students during project development, attended STEM night and spoke with students and families, and communicated through Google Classroom throughout the project.

- 95% of participating students showed increased interest in taking STEM classes
- 90% of participating students showed increased interest in pursuing a STEM major
- 90% of participating students showed increased interest in pursuing a STEM career
- 25% of participating students improved STEM-subject grade

"I'm so impressed with the way the students would try things like using a drill or screw driver on the chicken coup project without fear of making a mistake. If a mistake was made, the kids worked to solve the problem and helped encourage each other to further take risks and try other tasks. It encouraged me to build a chicken coup with my own son."
—Sam Miller, Civil Engineer, Phillips and Jordan/Miller Works
The goal of this project was achieved by hosting the first district-wide STEM Summit which successfully integrated the traditional regional STEM Fair with opportunities for middle and high school students to be exposed to the STEM focused competitions taking place at the high school STEM Smart Summit and to have meaningful interactions with judges from STEM-related fields. The event was held at Suncoast Polytechnic High School allowing students to take a walk over to Suncoast Technical College to see all the great opportunities available at the high school level and beyond. Middle school student teams also had the opportunity to participate in a dragster competition and a VEX robotics challenge which has historically been a high school-only event. The STEM projects were self-directed by the student and teachers served as an important resource to students as they pursued these STEM projects and were engaged with the project’s progress throughout. Volunteers from local STEM-related business judged the projects and participated in student interviews, connecting with students personally as the projects related to their field.

- 100% of participating students showed increased interest in taking STEM classes
Through this project students learned multi-disciplinary skills by designing, building, testing, and presenting do-it-yourself projects using various computer platforms, computer software, electronic components, and mechanical and structural components. With support of business partner Synaptic Sparks students learned how to safely operate equipment and use tools effectively, including Dial Calipers, 3D printers and a CNC Router. Students collaborated in teams and with mentors on these projects. Students followed a design process including developing a problem, brainstorming solutions, consulting stakeholders, surveying, designing, building prototypes and mock-ups, testing STEM principles, documenting their process steps, keeping a portfolio, marketing the product, and presenting solutions. They also participated in appropriate STEM competitions. Students met with mentors during school during the entire design process of their projects.

- 100% of participating students showed increased interest in taking STEM classes
- 66% of participating students showed increased interest in pursuing a STEM major
- 66% of participating students showed increased interest in pursuing a STEM career
- 31% of participating students improved STEM-subject grade
Project Green

Investing In Kids (St. Johns County)
Career Academies of the St. Johns County School District
Grades 9-12

338 students impacted
5 teachers participated

Through this project, students enrolled in engineering academies became knowledgeable about and considered all “green” aspects to a project they undertook and how that would result in a positive impact on the environment. Students worked in teams of 3 – 6 and: learned to work as a team as they researched; designed and implemented their project; identified an environmental issue that should be addressed; researched current strategies to resolve that issue; designed a new solution to have a better impact on that issue; utilized engineering or processing skills to provide a drawing, report and/or 3D model to showcase how the issue can be addressed; and improved public speaking skills as they competed to convince business partner Carter Environmental Services of the viability and cost-effectiveness of their project proposal.

- 100% of participating students showed increased interest in taking STEM classes
- 93% of participating students showed increased interest in pursuing a STEM major
- 75% of participating students showed increased interest in pursuing a STEM career
Precision Agricultural Drone Program

St. Lucie County Education Foundation
Southern Oaks Middle, Forest Grove Middle &
Samuel Gaines Academy
Grades K-8

30 students impacted
6 teachers participated

Middle school students were afforded the experience to learn how to operate and navigate UAV's/Drones, with the expectation they will continue exploring the opportunities to learn how to write code and program robotic equipment and utilize this technology in a commercial operation. This project utilized the Raspberry Pi microcomputer-based Robot Hive technology to develop an affordable resource for education, student projects and applications. The networked wheeled robot has been implemented for educational workshops, demonstrations and is now being adapted for more advanced future projects towards cooperative robotics. The implementation of the networked wheeled robot with LiDAR and other sensors allow for data collection about an environment to be collected and processed in a centralized location allowing for potential environment mapping, context awareness and location awareness through Simultaneous Location and Mapping. This technology demonstrated the value of drone robotics in the business world, especially as a tool to commercialize science and enhance conservation. Specifically, the use of these drones is applicable to precision agriculture where drones can help ranchers and farmers monitor crops. This project supported the “Farm to Fly” program developed by business partner Treasure Coast Education Research Development Park Authority.

- 80% of participating students showed increased interest in taking STEM classes
Techno Logic

Sumter Schools Enhancement Foundation
South Sumter Middle School
Grades 6-8

240 students impacted
2 teachers participated

Students were given a chance to demonstrate their construction and programming skills in a physical, hands-on environment through the use of Lego EV3 Robots. Building and programming the robots involved teamwork and developed problem solving and math skills. The robots were incorporated into science classes where students experimented with the robots' ability to sense colors, light, temperature, sound and motion as well as the data logging features and the ability to be controlled and monitored through Wi-Fi and Bluetooth technology. Schools held a monthly challenge day where classes competed against each other to complete a STEM challenge. Students worked with the mine manager at CEMEX to learn all the components of the Drag line and how it is controlled through remote sensors. Students also worked with engineers at Lockheed Martin and learned about skills critical to the engineering field and career opportunities. Students experienced several simulators and learned about the coding process used to write the scripts to operate them. STEM contacts from Lake Sumter State College shared information with the students about education options available to pursue careers in STEM fields.

- 100% of participating students improved STEM-subject grade
- 83% of participating students showed increased interest in taking STEM classes
- 65% of participating students showed increased interest in pursuing a STEM major
- 65% of participating students showed increased interest in pursuing a STEM career
**Engineering Robotics**

Taylor County Education Foundation  
Taylor County High School  
Grades 10-12

85 students impacted  
1 teacher participated

Through this project, students became familiar with the engineering cycle and completed a MOSS robotics kit. They gained knowledge about engineering careers in their local community and showed a significant improvement in interest in engineering careers. Enrollment in upper level science classes beyond Chemistry doubled for the 2017-18 school year. Students were also able to volunteer in the primary school to help increase interest in robotics in second grade classrooms. Students designed a STEM carnival and spent an entire day with second graders. Second graders visited STEM booths and one showcased the robotic kits featured in this year and last year's AT&T STEM@Work robotics grants. The time spent with engineers and learning about Georgia Pacific jobs opportunities and how future factories would feature robotics helped keep students interested in the content and they were able to complete the school year with improved grades and look forward to next year.

STEM and robotics programs are being established in primary grades and students were excited to work with younger children.

- 59% of participating students showed increased interest in taking STEM classes
- 49% of participating students showed increased interest in pursuing a STEM major
- 42% of participating students improved STEM-subject grade
- 35% of participating students showed increased interest in pursuing a STEM career

"Our local Georgia Pacific is looking for students who are interested in pursuing STEM degrees and returning to their community to live and work. By establishing mentorships between engineers and local students, Georgia Pacific hopes to produce future STEM graduates and that will contribute to the Taylor County work force." —Scott Mixon, Georgia Pacific Public Relations
**STEM in Space**

Florida Panhandle Technical College Foundation
Washington County District Middle/High Schools
Grades 6-11

50 students impacted
4 teachers participated

Through innovative learning activities provided by Team America Rocketry Challenge Program, students were engaged in educational and hands-on experiences to help them learn science, technology, engineering and math concepts. Students designed, built and launched model rockets, making engineering and math “come to life.” When designing model rockets in the computer lab, students had an opportunity to match their ingenuity with the limits of Newton’s Laws of Physics and Boyle’s Law of Gases in order to design their own model rocket to be aerodynamically sound. Fine motor skills were honed during the construction of the rockets as they measured, cut, and glued their rocket parts to the specifications that they themselves determined. Teamwork was a skill acquired as they organized into groups with many specialized responsibilities for the purpose of launching their rockets and collecting valuable data to be processed and analyzed in the classroom. Several business partners supported this project and brought community awareness to the value of STEM education, including: **Community South Credit Union, One South Bank, City of Chipley Police & Fire Departments, Washington County Sheriff’s Office, Kiwanis Club of Chipley, Gulf Power Company, Deal Consulting, Florida State University STEM Institute, and Naval Surface Warfare Center.**

- 59% of participating students showed increased interest in taking STEM classes
- 49% of participating students showed increased interest in pursuing a STEM major
- 35% of participating students showed increased interest in pursuing a STEM career
- 24% of participating students improved STEM-subject grade
Publicity and Additional Project Materials
PROJECT MAKEOVER BRINGS STEM TO LIFE AT STEPHEN FOSTER ELEMENTARY

By Lena Schwallenberg
© February 28, 2017 | Education

On Friday, as notification emails for acceptance into Stephen Foster Elementary School’s STEM magnet program were sent out, UF students made their way in, preparing for a weekend-long beautification project at the school.

Project Makeover is a UF student-run organization that annually selects and decorates an Alachua County elementary school. More than 1,000 student volunteers spend one weekend in the spring giving the school a makeover, including painting murals, planting gardens and creating alternative workspaces such as outdoor classrooms.

Founded in 2008, Project Makeover chose Stephen Foster Elementary to be their tenth makeover. According to Lisa Peterson, principal of Stephen Foster, they approached their district representative for Project Makeover, submitted a request to be selected in May and were notified in early fall that they had been chosen.

“Our school has the STEM magnet program for public school students, so we’re highly focused on project-based learning. It was basically a science theme,” Peterson said.

In waves of 200 to 300 at a time, students donated their time decorating, painting moon phases and famous scientists on walls and creating a “maker space” where students can collaborate and problem solve.

“[Monday morning], there was a wide-eyed sense of awe and excitement and joy over the maker space. [Students] were so excited. There was a real look of interest and enthusiasm,” Peterson said.
These makeovers impact more than just the aesthetic of the school, according to Lisa Scott, an associate professor of psychology and director of UF’s Brain, Cognition and Development Lab.

“There are ways of designing environments to support learning,” Scott said. “Visual stimuli would be particularly important in drawing students’ attention.”

There is a time when clutter can be more distracting than helpful, but that can be remedied by ensuring that each piece serves an educational purpose.

“Design work station or specific topics that have visuals that are not just extraneous visual information,” Scott said.

Daniel Burney has taken part in two makeovers, once during his time as vice principal of Charles W. Duval Elementary School and last year as principal of M.K. Rawlings Elementary School. He said that there has been a continued increase in student success following the project.

“As far as student academic achievements, our overall school grade improved one letter grade,” Burney said. “We don’t attribute that to one thing, but I’m sure things like Project Makeover helped improve the level of
engagement and awareness."

Burney said that the murals and landscaping put in place by the Project Makeover team look the same as they did when they were first created and that a smaller group of volunteers will be visiting in the next few months to touch things up.

"[Project Makeover] gets better and better every year," Burney said. "There was more of a focus on sustainability this time around. The things that were done would look good even in years to come."

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When a school is matched with Project Makeover, the team works with administrators to craft a plan and a theme. Selection and preparations start in May and continue into February or March when the makeover occurs.

There has not be any formal data collection conducted by the Project Makeover team, although current director Lucy Toman said she plans to look into launching research. She said the majority of feedback comes from teachers who claim their students are more engaged and site visits to past schools.

"If we can go in and make a positive impact to maybe help a child be more excited about learning and more enthusiastic about staying in school, that's the best impact we can have," Toman said.

Project Makeover has worked with 10 of 22 Alachua County public elementary schools. Toman said that while there are still many local schools that can be selected, she would like to see the organization expand.

"I think it would be really cool if we could extend Project Makeover to other counties or expand to other universities," Toman said.
May 16, 2017 was National STEM day. STEM is an acronym for Science, Technology, Engineering, and Mathematics. At MacClenny Elementary School, science lab instructor, Mrs. Margie Hill, was teaching first and second grade students about coding.

STEM education is the intentional integration of science, technology, engineering, and mathematics, and their associated practices to create a student-centered learning environment in which students investigate and engineer solutions to problems, and construct evidence-based explanations of real-world phenomena. There is a focus on a student’s social, emotional, physical, and academic needs through shared contributions of schools, families, and community partners.

AT&T offered a $2,000 grant for technology in the classroom. The grant was written by Margie Hill, the MacClenny Elementary School teacher in the Science Lab. The program chosen was COSMO. The reason for choosing the program is that it is first, a hands-on application in which the students can control the moves made by Awbie. Mrs. Hill told us, “By using this program we are able to expose students to the first stages of coding, which in turn will prepare them for technology of the future. This program builds teamwork as well as critical thinking. This in turn will be able to help them in all aspects of learning.”

Working in teams, they were coding the game on the computer and learning how to give the instructions to the computer to create the game to their specifications. They were coding the characters to move up, down, left, right and jump. It was quite a sight to see these young minds putting it all together. This was a creative way to celebrate start students off learning Technology, Engineering Mathematics in a practice that makes sense to them. They even realize how much they are learning!
LEESBURG, FL—Students at Umatilla Elementary School will benefit from a statewide investment by AT&T this year, one that seeks to increase understanding of how classroom curriculum translates into STEM (science, technology, engineering and math) careers.

To provide a critical link from classroom to careers, AT&T is once again collaborated with the Consortium of Florida Education Foundations (CFEF) to provide experiential learning opportunities for students in school districts across Florida. Real-world application of STEM education concepts, problem-solving and critical thinking skills will all be key elements of the 34 separate projects to be organized and funded through CFEF member local education foundations, including the Educational Foundation of Lake County.

The Grant will fund the Engineering Our Future project geared toward 5th graders at Umatilla Elementary School. Fifth graders will have the opportunity to learn how to use diagnostic and problem solving skills as they apply to possible future careers in STEM fields. The problem solving process and the critical thinking it entails are embedded into practice by people successful in many jobs. Fifth graders will learn to apply this approach into their school work and beyond.
The project will include approximately 100 students, 5 teachers and a partnership with Electron Machine Corporation. As the grant proposal reads, “We are eager to partner with Electron Machine Corp. to facilitate the connection our students need to realize the value of science and math to their future by engaging them in actually using a problem solving approach.”

Upon the program’s completion, the proposal identifies the overall expected learning outcome to be an increase of Umatilla Elementary School 5th grade students’ math and science performance to 75% at a minimum on the spring exam.

“We know that industries engaged in STEM disciplines will create a majority of high-value, high-wage jobs and within ten years, almost nine out of ten new jobs will require education beyond a high school degree,” said Joe York, AT&T Florida President. “We are pleased to make this contribution because Florida’s K-12 education foundations are well positioned to be the link between schools and local businesses for students, enabling them to build connections with potential employers in their communities, get a sense of what careers they offer and the skill sets they require.”

Another CFCEF contributor has followed AT&T’s lead to provide a similar STEM program with local impact throughout Florida. The Motorola Solutions Foundation is funding seven larger-scale projects through a competitive grant process.

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About AT&T

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AT&T Inc. (NYSE:T) is committed to advancing education, strengthening communities and improving lives. Through its philanthropic initiatives, AT&T has a long history of supporting projects that create learning opportunities; promote academic and economic achievement; and address community needs. In 2010, more than $148.2 million was contributed through corporate-, employee- and AT&T Foundation-giving programs.

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About the Consortium of Florida Education Foundations (CFEF):

The CEF is the membership organization for Florida’s school district-wide local education foundations. Established in 1987, the CEF seeks to advance student achievement in Florida by increasing private sector investment and involvement in public education. The CEF now has 62 member foundations with 1,100 business and community leaders serving as volunteer board members. Collectively, they raise more than $63 million annually to support students, teachers and schools through a variety of programs. The CEF has provided more than $32 million to local education foundations since 2001 through various private- and public-sector partnerships, including the State of Florida School District Education Foundation Matching Grant Program.

The Educational Foundation is a nonprofit organization that is the direct support organization for Lake County Public Schools. Our mission is to serve as the connection between our community and public education, evaluating needs and securing resources to enhance quality of education.
About 7 years after the launch of this initiative, Lee County schools are seeing fruits of their labor throughout the community.

**At a glance**

**STEM** stands for Science, Technology, Engineering and Mathematics. These fields are seeing a critical skills gap. There are many programs encouraging students to pursue STEM careers. Here are some of the local initiatives:

**STEMmiWork**: Give students hands-on STEM activities and field trips by working with business partners in the community.

**Teacher Immersion Program**: Take teachers and school administrators into local businesses so they can better incorporate STEM into their curriculum.

**STEM Institute**: Provide hands-on activities and field trips for K-12 students through the Conserve School of Southwest Florida. In addition, it has workshops for teachers and programs specifically for high school students.

**STEMmiWork team** Adam Rand, Alex Muheve and Zina Ata start work on a catapult to be built from PVC pipe and rubber bands. When completed, it would launch a tennis ball. More than a dozen teams competed to claim honors for the catapult that sent the tennis ball the farthest or the highest. The exercise in teamwork and creativity for the high school students took place Wednesday at the STEM wrap-up day at Florida Gulf Coast University.

See STEM, Page 3D
STEM

Continued from Page 10

tichen skills in Southwest Florida.

But that’s not all, said Jon Romine, owner of the Fort Myers-based EnSite Inc. engineering and design firm.

“Every career involving STEM requires critical thinking and problem-solving,” Romine said, adding those abilities are important to success in any job.

And, that importance is only going to grow. The National Science Foundation estimates that 80 percent of the jobs created in the next decade will require some form of math and science skills.

Last week, Romine, Gary Griffin, president of B&I specialty contracting, and Tom Mueller of Covanta Lee Inc. — the waste-to-energy facility — lent a hand at the annual STEM@Work Wrap-Up event at Florida Gulf Coast University. It drew about 150 students from 13 Lee County high schools.

Participating in STEM@Work “really opens your eyes to how many STEM careers there are,” said Alex Mulvey, who attends Dunbar High School. He’s interested in a career in electrical engineering.

Griffin of B&I leads the Foundation for Lee County Public Schools’ board of directors. He noted: “It doesn’t matter what field you want to go into. If you want to be an artist, you can use STEM skills.”

The wrap-up event had two main parts.

Indoors, student teams from each school gave presentations on how they’ve benefited from STEM@Work.

Separately, students were assigned to small groups, to design and build catapults from PVC pipe and rubber bands.

Cheers and groans erupted as the catapults launched tennis balls across the lawn in front of FGCU’s library.

The catapult challenge aimed to foster creativity, problem-solving and teamwork.

Nick Bell, 22, was among a handful of college interns advising and encouraging the teens.

Bell is a 22-year-old University of Florida senior who’s majoring in mechanical engineering.

He has an internship with B&I this summer, and recalls doing some STEM projects as a student at Fort Myers High.

But he doesn’t remember anything like the catapult project. He especially liked how it put together students from different schools, to collaborate and to be creative.

“That was cool,” Bell said, adding: “There definitely are people out there working to provide opportunities for these kids.”

Griffin said that while STEM@Work has done well with high-school-age pupils, “ultimately, we need to get in front of students in middle schools and elementary schools.”

Schools in their regular sessions could do more to promote “project-based learning, which is more about applying what you know,” Romine said. “That’s how we work in the business world.”

Both Romine and Griffin also wish state education leaders would put less emphasis on measuring schools’ performance through a battery of tests.

The time devoted to preparing for these tests and taking them curbs opportunities for hands-on STEM lessons and field trips, the two business leaders said.

STEM education initiatives also would advance more quickly if more employers got involved, Romine added.

“We have to be part of the education system,” Romine said, “and not just expect the system to produce what we want.”

Connect with this reporter @Alvyscribe (Facebook) and LauraPatrickRuane (Twitter).
River Ridge robotics team shines at national championship

Michele Miller, Times Staff Writer

Friday, May 2, 2017 6:00am

NEWPORT NEWS — For the past two years, the River Ridge High School Royal Robotic team has fought its way to the semi-finals in prestigious national robotic competitions.

That's pretty impressive for a team that's winning up its second season after making it to the semifinals and earning the Excellence Award in the 2015 FIRST Championship in April in Houston.

The 23 members of the Royal Robot team are among some 2,500 students to compete in Houston. Another championship event was held later in the month in St. Louis. Winners of the two events will face off at the Festival of Champions in July in Manchester, N.H., where FIRST originated.

FIRST, which stands for Fostering Inspiration and Recognition of Science and Technology, is a nonprofit organization founded in 1992 to build student interest in science, technology, engineering and math and develop leaders through mentor-based programs and competitions for students ages 6 to 18.

Last year, the Royal Robots landed a spot at the 2016 FIRST Championship after winning the Rookie All Star award at a South Florida Regional in West Palm Beach.

This year, the Royal Robots earned their spot for winning the FIRST Lone Star Regional Competition in early April in Houston.

"We've been training in two years is really remarkable, and they're competing with some really seasoned teams," said Tony Gauthier, director of career and technical education for the Pasco County schools.

"It's amazing, I think we definitely made a statement this year," said River Ridge High engineering teacher San Matsuda, who mentors the Royal Robots along with volunteer Tom Allen and Dave Rabin.

Their success is the result of the team's decision to step up the robot's design and also team strategy, said team co-captain Alan Allen, noting that Royal Robots were the Excellence in Engineering Award at regional competition in Alabama as well as the Industrial Design Award at the regional tournament in Houston.

Last year, the team's boxless design meant to appeal to seasoned teams and to help build alliances with other teams.

It worked, Allen said. "Last year we were seventh about 25 miles away. We were able to take on the mindset of being a leader and winning the game. The planning, the design, the engineering was up there, and that definitely added to our level of success."

"It's very exceptional," said Zach Babcock, 19, one of four remote control "drivers" on the team. "We all did our part.

The team had a week to build and program a robot before it was "tagged and bagged," with no work allowed until about 9 a.m. on the competition.

Bonnell was surrounded by a series of assistants between two opposing alliances of three robots teams each on a carpeted playing field.

"One thing about FIRST is that you have to be able to work with other teams," Allen said. "Even the best robots win if you don't do that. That's how you win. It's based on teamwork.

In the 2016 competition, teams earned points for their robots' ability to collect large "pucks," fire balls into a tall tower and climb a rope.

Team members worked on a secondary "train" practice robot to make improvements, mostly using the robot's "shutters" for accuracy. The team also hosted practice seminars with Team 597, a FIRST robotics team based out of East Lake High School at Tarpon Springs.

"We averaged about 45 hours a week," said Allen, who spent about 20 hours a week mentoring other teams prior to competitions. "It's definitely a commitment — not something to be taken lightly."

The commitment paid off.

"I'm very impressed with them," Matsuda said. "It's pretty good way for them to get experience. It offers an opportunity for those who want to spend 30 to 35 hours a week working on an engineering project. They could be home playing video games or eating out with their friends, but they are here at school building robots."

Team members raise money as well as help pay for expenses to get to competitions, Matsuda said, noting that the PACE Education Foundation matched contributions from AT&T, Southern Manufacturing Technologies, Great Lakes Solar, DeVry Education Group, MacMillan Labeling Systems, the Foundation for Community College Innovation, Affordable Golf Carts, San Francisco Veterinary Hospital, Miles Kia Insurance and Sunstate Credit Union.

While seniors on the team are now done with FIRST, some are taking the next step.

In the fall, Allen will head to Boston to study biological engineering at the Massachusetts Institute of Technology. Babcock will study mechanical engineering at the University of West Florida. Kevin Rutlal and Tom Rainer plan to study computer science and mechanical engineering, respectively, both at St-Carnes State College and then at the University of South Florida.

"This has been a really good experience," Babcock said, adding that his experience on the robotics team helped land an internship last summer at Lockheed Martin in Colmaran. "Being a senior and this being my last year, it's really a good way to end the season."

Contact Michele Miller at miller@tampabay.com. Follow @MicheleMiller.

River Ridge robotics team shines at national championship 05/02/17
Photo reprint | Article reprint

Polk schools get AT&T grant for S.T.E.M.

Friday
Posted Dec 30, 2016 at 7:05 PM
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By Madison Fantozzi

LAKELAND - Students at two Polk County schools will get some hands-on S.T.E.M. lessons thanks to grant money from AT&T.

Winston Academy of Engineering in Lakeland and Chain of Lakes Elementary in Winter Haven each received $2,000 as part of a statewide investment by AT&T for Science, Technology, Engineering and Math programs in schools, the Polk Education Association announced this week.

"We know that industries engaged in S.T.E.M. disciplines will create a majority of high-value, high-wage jobs," AT&T Florida President Joe York said in a statement. "We are pleased to make this contribution because Florida's K-12 education foundations are well positioned to be the link between schools and local businesses for students, enabling them to build connections with potential employers in their communities, get a sense of what careers they offer and the skill sets they require."

S.T.E.M. jobs are projected to grow faster than the average growth for all occupations, according to the U.S. Bureau of Labor Statistics, and wages in these occupations are generally higher than the median for all other occupations.

The Bureau projects S.T.E.M. jobs to grow 13 percent by 2022, compared to the 11 percent growth rate projected for all occupations by that year.

S.T.E.M. workers use their knowledge to try to understand how the world works and to solve problems, often using computers and other tools.

At Winston Academy, the school's S.T.E.M. lab will use fabrication equipment to create coops to house chickens students hatch through an incubation process with the help of business partner, Miller Works.

"Students will actively engage in the engineering inquiry cycle to collectively work as a class-oriented community of learners to complete an engineering task that begins with incubation of eggs to building a chicken coup [sic] to house adult chickens that will be laying eggs," Shannan Combee, Polk Education Foundation's grants manager wrote in a press release. "They will consider
environmental, budgetary, aesthetic and design constraints to plan, digitally design, fabricate and assemble the project."

At Chain of Lakes Elementary, students will work on a project to classify, catalogue and conserve native Florida species on their campus - including amphibians, reptiles and birds - with the help of business partner, Kleinfelder, a science and engineering consulting firm based in Tampa.

"(The project) will transform first-grade students into wildlife biologists who can speak knowledgeably about native Florida species and how they benefit our environment," Combee said.

Students will participate in the projects through April.

There will be 34 projects across the state funded by AT&T's grants to the Consortium of Florida Education Foundations.

"Real-world application of S.T.E.M. education concepts, problem-solving and critical thinking skills will all be key elements," Combee said.

- Madison Fantozzi can be reached at madison.fantozzi@thelledger.com or 863-802-7547. Follow her on Twitter @madisonfantozzi.
**Community**

Local engineers will mentor STEM students

Students at Taylor County High School (TCHS) will benefit from a statewide movement by AT&T this year, one that seeks to increase understanding of how classroom curriculum translates into STEM (science, technology, engineering and math) careers.

AT&T is once again partnering with the Consortium of Florida Education Foundations (CFEF) to provide supplemental learning opportunities for students in school districts across Florida. Real-world application of STEM education concepts, problem solving and critical thinking skills will be key elements of the 54 separate projects to be organized and funded through CFEF-member local education foundations, including the Taylor Education Foundation (TEF).

TCHS officials said they are pleased to partner with AT&T and Georgia Pacific to bring engineering alive in the classroom."Students enrolled in chemistry at TCHS will spend their Fridays this semester studying engineering principles and designing projects," said TCHS Principal Audie Ash.

"Engineers from our local Georgia Pacific plant will be available to teach lessons and to understand engineering principles as they apply to robotics," TCHS Director Jan Walker said.

"Students at TCHS will be following the engineering cycle to learn the process and understand engineering principles as they apply to robotics," Walker said.

"We know that initiatives engaged in STEM disciplines will create a majority of high-valued, high-wage jobs and within 10 years, almost none of 10 new jobs will require education beyond a high school degree," said Joe York, AT&T Florida president. "We are pleased to make this contribution because Florida’s K-12 education foundations are well positioned to be the link between schools and local businesses for students, enabling them to build connections with potential employers in their communities, get a sense of what careers they offer and the skill sets they require."
AT&T donation to benefit STEM students

Kelly Starling, YourNews contributor 12:59 p.m. ET March 2, 2017

Students at Port St. Lucie High School, and Forest Grove, Southern Oaks, Samuel Gaines and West Gate Middle schools will benefit from a $2,000 contribution from AT&T to the St. Lucie County Education Foundation.

The contribution is part of an AT&T statewide investment in partnership with the Consortium of Florida Education Foundations (CFF) (http://www.educationfoundationsfl.org) to provide experiential learning opportunities for students in school districts across Florida. Real-world application of STEM education concepts, problem-solving and critical thinking skills will all be key elements of the 34 separate projects to be organized and funded through CFF member local education foundations, including the St. Lucie County Education Foundation.

The St. Lucie County Education Foundation will use the $2,000 contribution for two local projects:

- The Farm to Fuel program at the Treasure Coast Education Research and Development Authority: Students will get the opportunity to program and operate unmanned aerial vehicles to monitor water quality in conjunction with precision agriculture. With global population projected to hit 9.7 billion in 2050, precision agriculture will be needed in order to sustain the population increase.
- The Hive Program: With direct support of the Career Technical and Education Department, Port St. Lucie High School students will work with Florida PolyTech students in the Electrical and Environmental Engineering department to learn to code, program, design and use a 3-D printer, and communicate with one another through the use of technology. The takeaway from this experience, will afford our students the opportunity to monitor water quality in conjunction with precision agriculture.

Read or share this story: http://www.tcpalm.com/story/specialty-publications/your-news/st-lucie-county/reader-submitted/2017/03/02/at-t-donation-benefit-stem-students/96630100/
Polk schools get AT&T grant for S.T.E.M.

Madison Fantozzi | 14 hours ago

Winston Academy of Engineering students pose with the school’s $2,000 grant from AT&T for its S.T.E.M. program. The school will use it for a fabrication lab for its elementary students to build chicken coops to house chickens they help hatch from incubated eggs. PHOTO PROVIDED
Kimberley Lough @loughk1

Learning to seed Rock Wool & Oasis Cubes. Thank you @ATT for our STEM grant! @LincolnMiddleFFA

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**Google Alerts**

**Consortium of Florida Education Foundations**

Daily update - December 31, 2016

**NEWS**

**Polk schools get AT&T grant for S.T.E.M.**

*The Ledger*

At Winston Academy, the school’s S.T.E.M. lab will use fabrication equipment ... by AT&T’s grants to the Consortium of Florida Education Foundations.

Flag as irrelevant
AT&T STEM at Work Grant:

AT&T STEM at Work grant funded two $2,000 STEM (Science-Technology - Engineering- Math) grants through the Consortium of Florida Education Foundations (CFEP). The intention of AT&T is to provide students with opportunities to better understand an area of STEM through workplace-based experiences and to increase their awareness and interest in STEM careers.

Chain of Lakes Elementary “Amphibians, Reptiles, and Birds, Oh My!” is an innovative project that will transform first grade students into wildlife biologists who can speak knowledgeably about native Florida species and how they benefit our environment. The objective of this project is to classify, catalogue and conserve native Florida species on campus and will be accomplished through partnership with Kleinfelder, a science and engineering consulting firm that is committed to growing the next generation of STEM professionals. Winston Academy’s project, “Project Fab Year 1 - Engineering for Agriculture,” will introduce fabrication curriculum to elementary students. The focus of year one will be creating an on-site chicken coop(s) facility that will house chickens hatched through the STEM units in primary grades. Students will actively engage in the engineering inquiry cycle to collectively work as a class oriented community of learners to complete an engineering task that begins with incubation of eggs to building a chicken coop to house adult chickens that will be laying eggs. They will consider environmental, budgetary, aesthetic and design constraints to plan, digitally design, fabricate and assemble the project. Project Fab will continue each year with a different design and engineering task. Both programs will run through the end of April 2017, thanks to the 2016-2017 AT&T STEM at Work grant.
Amphibians, Reptiles, and Birds, Oh My!

A special thank you to AT&T and Polk Education Foundation for the grant to provide this opportunity during the 2016 – 2017 school year.
The 2017 #STEM Fair & Summit Awards are beginning! Kudos to the talented students and proud parents who are joining us to celebrate tonight! #sarasota
AT&T ‘STEM@Work’

Students to Experience ‘STEM@Work’ Through AT&T

For the seventh year in a row AT&T has partnered with the Consortium of Florida Education Foundations to support student achievement in STEM areas. The CFEF has received $75,000 to provide $2,000 grants to local education foundations to create real-world, hands-on learning experiences in the classroom to connect students with actual STEM professionals and careers through AT&T funding.

Since 2010, a total of $685,000 of AT&T funding has had the following impact:

- 300 projects
- 50,830 students impacted
- 696 STEM business partners engaged
- $1,019,200 total investment (with local match)

From creating human-powered submarines to propagating nematodes, each project varied depending on the goals and workplace partners involved. AT&T funds were used to provide supplies, equipment and transportation to make each classroom vision a reality.

This year 34 grants have been funded to provide creative learning opportunities that will have measurable impact on student understanding of STEM curriculum and interest in future STEM careers.

Check out the great projects of previous years by clicking on the links below.

- 2015-16 AT&T STEM@Work Program Report
- 2014-15 AT&T STEM@Work Program Report
Student Quotes

Okaloosa County, Enhancing Life through Product Design

“I wish that I came to this school and class sooner because it is very beneficial.” -- Apolinar R. (new student)

“This program will help many students interested in STEM” -- Eduardo T.

“It was the greatest experience ever!” -- Nehki H.

(even in ...) “taking care of animals, there’s a job to find plants that are healthy for the animal.” -- Brian F.

“I think the program (is) good because it gives (students) new ways to grow plants.” -- Excavion H.

“It’s a good program for others, interesting” -- Madison T.

“The program is very educational for students like me.” -- Miguel G.

“I really think it’s interesting to grow something without real sunlight.” -- Lilly S.

“It’s a very fun program!” -- Katherine C.

“This program helps us kids understand most subjects, and it can be a lot of fun.” -- Kayla M.

“It’s a very good program. It’s helpful in many situations and is a good wake-up call that life doesn’t revolve around phones. Thank you for that.” -- Emily W.

“STEM classes are interesting for school and a STEM career can be important to life.” -- Alexis H.

“I enjoyed seeing the plants grow every day when I come in (to class).” -- Adrian J.

(amazed at ...) “how the stuff you grow tastes good!” -- Davisha H.

“It showed how good it (the STEM applications for indoor plant growth) is, since it tasted the same as the ‘farming’ (aka traditional) plants.” -- Adrian C.

“I like tasting the vegetables.” -- Jesica R.

“It was very informative and fun, and I would love to do it again.” -- Alejandro P.

“It was cool to work with.” -- Aiden T.

“It was a fun learning process.” -- Stephanie O.

“It was a very good experience getting to try out the hydroponics.” -- Tyler B.

“It (the GrowTower) allowed me to see how the world is advancing and changing.” -- Alexandra N.

“Thank you for donating to Lincoln Memorial Middle School.” -- Armani H.

(I want to say that I...) “learned how to plant many cool things.” -- Jaylen W.

(I learned ....) “what good jobs are open.” -- Darrell W.

“It was a great program and I learned a lot and it was fun.” -- Mary B.

“The STEM program was fun and interesting.” -- Nicholas T.

“The program is pretty solid and very fun.” -- Lewis C.
Polk Education Foundation

Thank You
AT&T
Supporting PEF Programs
On behalf of Florida’s local education foundations, the Consortium of Florida Education Foundations thanks you for your commitment to enhancing student achievement and interest in STEM careers with your investment in AT&T STEM@Work.

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