

Davidson Middle School Unmanned Aerial Vehicle Program (UAVP)

Tim Sexton
Davidson Middle School
Crestview, Florida 32536
850-398-0949

Economics of the project:

Davidson Middle School is seeking for \$89,750 to purchase engineering tools that will teach Science, Technology, Engineering and Math (STEM) students the design process of 3D printing to build and test fly Unmanned Aerial Vehicles.

Project Expenditures (long term and short term):

1. Teacher certification and training -- National University online 3D certification = \$700, UAV pilot training certification \$4500 (Unmanned Vehicle University)
2. Surface Pro 3 tablets for each student and Service Plans Surface Pro3 with keypad, pen, case and 3 year service agreement =\$1122 x 25 tablets. Charging/storage cart = \$2300
3. 3D printers and supplies -- Afinia H800 3D Printer = \$1899 x 5 This many is needed so more students can get more printed. Supplies for the printer are the replacement filaments to last a couple of years. \$4500. Maintenance and replacement parts = \$2500
4. UAV assembling kits – ELEV-8 V2 Quadcopter Kit = \$710 x 15 (2 students per kit) UAV replacement parts or extra parts -- \$8500.

UAV flight simulator software -- Runtime Games Phoenix R/C Pro Simulator -- 25 x 220 =\$5500

Project Revenues (sales, donations, etc.): None

Other funds to be used in addition to Direct Component funds: None

Key personnel involved with the project:

Tim Sexton, Social Studies Teacher
Beth Walthall, Principal, Davidson Middle School

Specific objectives:

Providing students with the opportunity to work with Surface Pro 3 tablets and 3D printers to create Unmanned Aerial Vehicles will not only create interest in the area of our STEM subjects, but could also help them seek careers in other related fields such as designing, engineering, flight technology, robotics, programming and other opportunities they can seek at the high school level. The skill set

and confidence they will receive with a hands-on program early in their education could lead them even further than high school; college or other technical schools will no longer seem out of their reach or scope of knowledge. This program is designed to reach those students – middle school age students who are just not motivated by the traditional classroom setting.

Permits or land acquisition required: not sure if FAA will need me to have a permit.

Design status: I currently have a STEM class that works on the engineering design process. Most have done CADD and flight 15 day modules.

Process:

The UAV Program will start with incoming 6th graders and progress through 7th and 8th grade.

Sixth grade students will learn the basics of CADD programs, scale models, research and 3D design. They will also learn about UAV's and their many uses in the local area and in businesses.

Seventh grade students will continue the design process by creating an actual UAV shell. They will study the concept and electronics used in getting UAV to fly. They will then assemble the UAV and prepare for flight. The students will learn how to program/code the UAV to fly and return to home after completing a mission.

Finally, eighth grade students will continue flight of the UAV's, how to redesign them for specific purposes and how to experiment with them. They will study the FAA regulations and how to follow those guidelines. The students will also learn how to repair and troubleshoot UAV's. Mobile apps will also play an important role in the use of the UAV's.

Similar project success: Forest High School in Ocala Florida, Raymond James Educator. We talked about the lesson they did using UAV's to apply trigonometry concepts. It was successful and students got a better understanding of the sine/cosine graphs. We talked about it applying to other math concepts such as geometry, pre-algebra and even language arts when writing their solution to their findings in a journal.

Environmental impact: None

Risks to implement or maintain the activity: None

Jobs Created:

In a report released by the NMC Horizon Project, 3D printing will have a massive impact on education, particularly in the STEM areas in the next 3-5 years. Students who are trained in this technology and continue through the high school CHOICE program have the potential to earn \$35,000 lower level to over \$100,000 higher level.

Also, in a MyCorporation infographic, it is estimated that 3D printing will become a \$5.2 billion industry by 2020, with a projected 14 percent annual growth between 2012 and 2017. The types of

jobs students can seek are in the following areas: 3D design, 3D computer-aided design (CAD) modeling, Research and Development (R&D), and biological and scientific modeling. The UAV's career outlook includes the creation of 70,000 new U.S. jobs within the next three years, and 100,000 new U.S. jobs by the year 2025.



April 15, 2015

To whom it may concern:

Doolittle Institute would like to make known that we support the efforts of the Davidson Middle School robots program. Okaloosa County Schools have gain much momentum in the effort to bring engineering education to middle school students.

Mr. Sexton's program is a very promising option to carry that momentum forward. He has been a driving force in the community by hosting robotics competitions. These competitions are highly motivating to robotics teams in Okaloosa County in 4th through 8th grade and provide the opportunity to these students for a deeper understanding of robotics, engineering and teamwork.

Robotics Programs where students have access to unmanned aerial vehicles are the next wave of engineering learning about to further the robotics momentum already in place here in Okaloosa and surrounding counties. Our volunteers and supporting companies have recently taken steps to help with instruction in this area. Okaloosa County Schools are ready to make great strides and need access to funds to make this possible.

Davidson Middle School is a strategic part of the collaboration that will make a difference in STEM education and in the lives of students eager to learn engineering principles with the use of UAVs. Awarding Davidson Middle School funds from the Restore Act grant will be an excellent investment toward furthering engineering education for students engineering. It is my hope you select Davidson Middle School to receive a portion of these funds.

Please contact me if you have any further questions.

Sincerely,

Beth Hanning
Doolittle Institute
Director of STEM Education Outreach
beth.hanning@doolittleinstitute.org
(850) 502-9837

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April 14, 2015

Davidson Middle School
Attn: Tim Sexton
6261 Old Bethel Road
Crestview, Florida 32536

Dear Mr. Sexton,

Dynamic Software Solutions, Inc. (DS2) strongly supports your initiative to secure RESTORE Act grant funding for a drone technology and 3D printing program at Davidson Middle School.

We are a small business, in operation less than three years, and largely the product of local education and corporate mentorship. Our founder began his career in Okaloosa County as an undergraduate intern and is now Vice President and Chief Technical Officer of a successful twelve person company with annual revenues in excess of \$4M.

DS2 began as a specialized software engineering company, and quickly expanded our software development expertise into other business areas, including 3D digital modeling, which led to our involvement with 3D printing. We now operate three 3D printers and are under contract with the USAF Civil Engineer Center to produce thousands of scale models of heavy construction equipment, which are used for worldwide training of USAF civil engineering forces. Additionally, we have used 3D printing to manufacture replacement parts for technical equipment used in our business.

Our company is also involved with the Okaloosa County Economic Development Council's Technology Coast Manufacturing and Engineering Network (TeCMEN), a group which strongly supports STEM workforce development in the local area. Both 3D printing and the design, development, test and evaluation, and operation and maintenance of unmanned systems are primary objectives of the organization. As we've learned from the professional educators in that group, capturing the interest and enthusiasm of middle school students is essential to guiding future workforce development. The vision, outlined in your recent e-mail, to build student's software, additive manufacturing (3D printing), and engineering design skills is an ideal way to capture their interest and motivate continued advancement of needed technical skills.

We wish you the best in this exciting endeavor. If we can provide assistance in any way, please contact me at ed.dunbar@ds2corp.com or (C) 850-376-3904.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ed Dunbar'.

Senior Program Manager

April 12, 2015

Mr. Tim Sexton
Davidson Middle School
6261 Old Bethel Rd
Crestview, FL 332536

Dear Mr. Sexton:

It is our pleasure to support your efforts with this grant's my main goal of workforce development with the underlying theme of STEM education.

Your vision for your students is on target with today's interest in UAS education and Drone Technology w/3D printing.

We support your mission of preparing 6th graders on how to use a design software similar to CADD or the use of CADD to learn how to 3-D print different types of objects to get down proper techniques of scale drawings, drafting, designing.

We support your learning model for 7th graders to learn to code and program simple robots and use those techniques to begin programming for drone flight missions. Also, take the 3-D they learned in 6th grade and start designing drone parts and print out the body of a drone they design.

Your vision for 8th graders that they will review the engineering design process to continue their drone tech curriculum is preparing that pipeline needed for secondary and post-secondary education in Okaloosa County. They could build their drone, test and make the corrections. When they leave for the high school our hope is that they will continue this endeavor going into Crestview High into an aeronautics field with Embry Riddle Aeronautical University. This successful partnership is preparing a workforce that is needed and the skills obtained by these students will set them apart when seeking a job in the future.

Drones are about to take off when it comes to future job outlook. It is estimated \$82 million will funnel into the economy with over 100,000 job opportunities. We want our students to be prepared for this boom and we want them to work in Okaloosa County.

We are in full support of this initiative.

Sincerely,



Ron Garriga
Embry-Riddle Aeronautical University-Worldwide
Director, Campus Training and Professional Development, US Campuses
Director, Okaloosa Aerospace Academy
garriga@erau.edu



P.O. Box 9424
Humbert Field, FL 32544

GENERAL DYNAMICS
Ordnance and Tactical Systems

April 10, 2015

Dear Mr. Timothy Sexton:

I am writing to confirm my strong support for your Drone Technology with 3D Printing of Parts initiative for the Davidson Middle School. Clearly the UAS technology area is rapidly expanding and will require thousands of trained technologists, scientists, and engineers to support this growth. This technology area is interesting and is perfect to capture the imagination and creativity of middle school students. I heartily support your efforts to receive a RESTORE Act grant to help implement this program at your school.

Warm regards,

michael.ruff
@gd-ots.com

Digitally signed by
michael.ruff@gd-ots.com
DN: cn=michael.ruff@gd-ots.com
Date: 2015.04.10 15:20:45 -0500

Michael Ruff
Senior Director, Advanced Programs

HOVER CHECK AERIAL PRODUCTIONS



3025 Winkhamer Dr • Pensacola, FL 32503 • Phone: 850-450-3491
E-Mail: rsimpson@hover-check.com Web: www.hover-check.com

Date: 4/15/2015

Tim Sexton
Davidson Middle School

Dear Mr. Sexton,

I think educating the younger adults with the knowledge about drone technology is the right thing to do. With continued education it will lower the negative perception that has plagued the industry. What you have proposed with the Restore Act of 2012 will start an education curriculum at a younger age rather than waiting till they attend college.

Sincerely,

Richard Simpson

President/CEO

Hover Check Aerial Productions





Crestview Community Television

2260 South Fardon Blvd.
Suite 37
Crestview, Florida 32536

I have been flying multi-rotor UAV's for several years now and currently have three in our arsenal of electronic news gathering equipment. I am very much in favor of Davidson Middle School faculty member Tim Sexton and the Okaloosa School Districts desire to develop a UAV and 3d Printing Technology program at Davidson Middle School. Several of the current consumer UAV's on the market today have been created through 3D Printing Technology.

The Economic Impact of Unmanned Aircraft Systems Integration in the United States report shows the economic benefit of UAS integration. AUVSI's findings show that in the first three years of integration more than 70,000 jobs will be created in the United States with an economic impact of more than \$13.6 billion. This benefit will grow through 2025 when we foresee more than 100,000 jobs created and economic impact of \$82 billion.

These future UAV's will require programmers, engineers, and maintenance personnel. According to leading aviation economist, UAV technology will create more than 34,000 manufacturing jobs and more than 70,000 new jobs in the next three years. By 2015, total job creation is estimated at 103,776. The tax revenue alone to the states will total more than \$482 million in the first 11 years should integration begin in 2015 as proposed.

I fully support the use of RESTORE ACT monies to be used for this new program and have been in contact with Tim Sexton and have offered to donate one of our UAVs and our expertise and experience to the program to help get it off the ground.

Ken Nielsen
News/Program Director
Crestview Community Television