

USU Extension Grant: Final Report

| | |
|-------------------------|-----------------------------|
| Project Leader: | Denise Stewardson |
| Project Title: | Drones in Agriculture |
| Dates: | June 1, 2015 – May 30, 2016 |
| Total Requested: | \$10,000 |

Project Objective:

The objectives of the Drones in Agriculture program included:

- Introducing secondary teachers to the STEM applications of using drones to teach agricultural concepts that tie to Utah core and national curriculum standards
- Generating students' interest and increase their participation in STEM-related coursework
- Collecting feedback using a Qualtrics-based teacher-response survey to assess the future needs of teachers integrating the Drones in Agriculture program into their curricula.

Project Results:

Twelve teams of Utah secondary teachers (26 total) from the areas of agriculture, technology and engineering education, science, math, and art attended one of three workshops offered statewide. The teachers were instructed in the safety, construction, programming, operation, and agricultural applications of drones. These teachers were the recipients of mini-grants which included an X-wing quadcopter kit, instructional materials, and classroom resources.

Workshop participants evaluated the extent to which the project's objectives and outcomes were met. This teacher-survey was distributed via an online Qualtrics survey. The results of surveys received to date have been overwhelmingly positive. For example:

- How valuable was this workshop in meeting your teaching needs?
55% Very valuable
45% Valuable
- Would you recommend this workshop to others?
100% Yes

Additionally, teachers made the following comments:

- "I will use drones to emphasize the importance in chemistry. Drones are used to track pathogens, climate change, monitor chemical plants and operations, etc."
- [Drones] will be integrated in the classroom as we discuss alternative technologies in agriculture. It will also be presented to our FFA chapter."

Note: All survey results are available on a Qualtrics survey report.

Another goal of this grant was to gauge teacher interest in developing a competitive quadcopter challenge. As a result of the teachers' participation and motivation, the ROAV (Remotely-operated Aerial Vehicle) Challenge has been designed and is in its initial phase of introduction.

ROAV Challenges have been demonstrated twice in 2016—at the State FFA Career Development Events (April 26, 2016) and at Utah State University (May 14, 2016). Plans for future challenges are scheduled for 2016-17. Teams of students—including FFA chapters—are invited to design, build, and compete with their drones. This video link showcases the event held at USU in May 2016: <https://www.youtube.com/watch?v=yZrUvFjDihk>

This project's objectives and results have been presented statewide and nationally at the following conferences and workshops:

- International Technology & Engineering Educators Association Annual Conference: March 2016 (Washington, D.C.)
- Technology & Engineering Education CTE Conference: June 2016 (West Jordan, Utah)
- Utah Association of Agricultural Educators Summer Meeting: June 2016 (Vernal, Utah)
- National Agriculture in the Classroom Annual Conference: June 2016 (Phoenix, AZ)

Dr. Gary Stewardson, project PI, also demonstrated the quadcopter ROAV Challenge (by invitation) at the 2016 Hill Air Force Base “Warriors Over the Wasatch” Open House and Air Show, June 2016.

The excitement and interest in Drones in Agriculture have been extremely positive from teachers, students, and the community. Hill Air Force Base has provided funding for technical equipment; additional funding for teacher workshops is being pursued via educational grant opportunities and USU Extension funding. The sky's the limit! (Pun intended.)