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## Developing Career Pathways in UAS for Non-Traditional Students through Collaborative, Online Learning Environments

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# Developing Career Pathways in UAS for Non-Traditional Students through Collaborative, Online Learning Environments



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## Background

- Institutional Characteristics: Private, four-year university recognized for STEM disciplines related to aerospace and aviation fields of study
- Student Characteristics: The majority of Embry-Riddle Aeronautical University-Worldwide identify as Active Military, Veterans and Adult Learners
- Benefits of using of uncrewed systems and drone simulation software to increase STEM literacy-
  - Contextual learning
  - Collaborative learning
  - Real-life, problem-based scenarios
  - Increased Interest and engagement
  - Potential to support persistence and retention of non-traditional groups
  - Positive experiences of Veterans, Adult Learners and Active Military

## Why

- **Why** introduce new technologies through simulation software?
- Current workforce skills are needed that reinforce creative problem-solving and that build confidence in students pursuing STEM-related careers in new fields of study such as uncrewed systems.
- Small uncrewed systems (drones) provide exceptional opportunities to introduce general STEM concepts through affordable technologies



## How

Introduce **STEM curriculum** through drone software

- Mathematics: geometry, shapes, coordinate system, vectors
- Physics: lift, drag, inertia, mechanics, electrics, electronics
- Computer science: algorithms, logic, variables, conditions, programming languages
- Technology: robotics, energy storage

**Software examples:**

- AutoCAD Fusion 360
- SIMNET AERO
- PIX4D
- LabView
- ERAU ERUPTSim
- Real Flight Sim

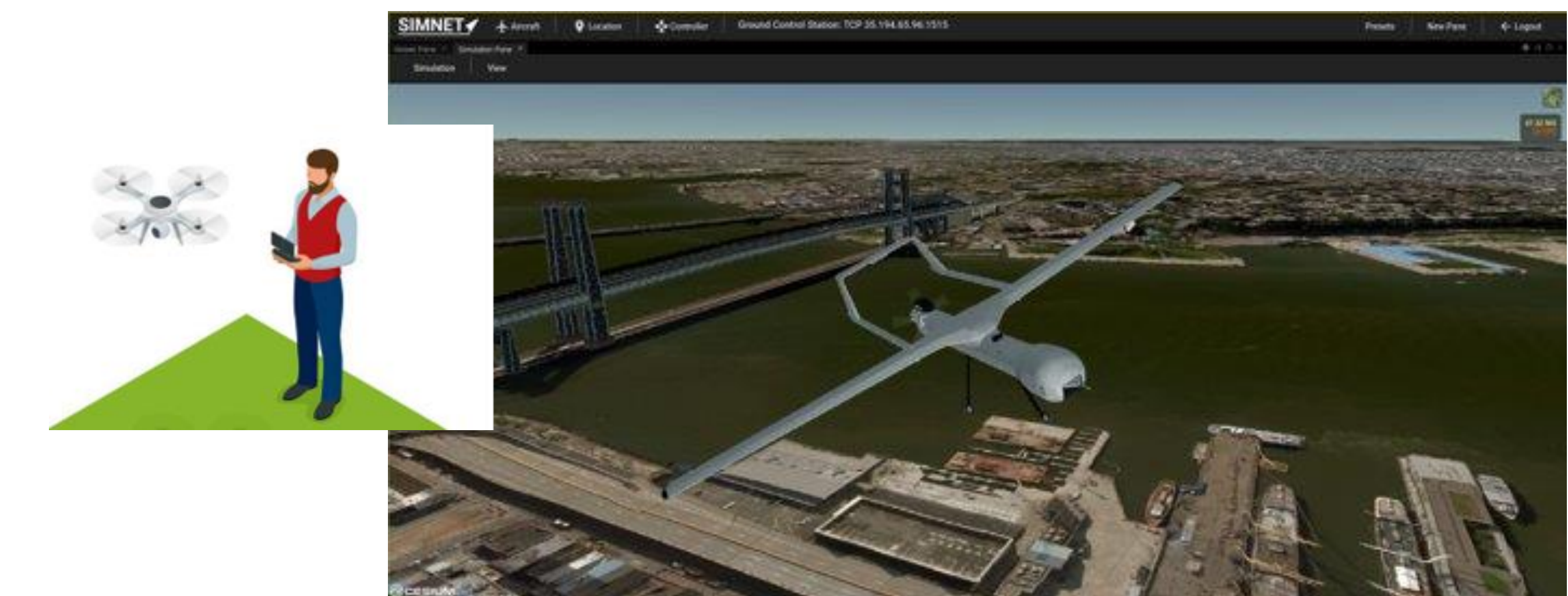


## Results

- Increase in Student Satisfaction
- N= 300 students across 6 sections
- Constant feedback was implemented over several terms to improve the student experience.
- Initially students needed adjustment phase.
- Personal instructor engagement is important.
- The following themes emerged from the qualitative responses: Real-world connection, industry exposure, design and engineering experiment, personalized learning experiences
- *Quotation: I liked how it was cumulative and ended in a simulation demonstration. I liked the use of the simulation. It gave me some hands-on experience, which is what I'm mostly looking for.*

## Summary

The integration of drone technologies through online simulation platforms and uncrewed system scenarios offer opportunities to introduce STEM concepts from the fields of robotics, computer science, mechatronics, and aviation.



New software technology developments will increase student engagement in STEM education and support learning of uncrewed systems applications and operating competencies

The use of drone simulation software creates a collaborative environment for group activities and sharing of results with peer review.

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