**Transfer of Training Considerations for Operating Unmanned Aerial Systems (UASs)**

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**Background:** The FAA Modernization and Reform Act of 2012 mandated the integration of unmanned aerial systems by 2015. In response, the FAA released a Notice of Proposed Rulemaking (NPRM) on small UAS on 23 February, 2015. The NPRM will allow the widespread use of small UAS for commercial purposes such as agricultural monitoring, power line inspections and aerial photography. The NPRM defines small UASs as those weighing less than 55 pounds. It will restrict use to daytime, line of sight operations below 500’, among other restrictions. Notably, the proposed rules address the contentious topic of UAS operator training and certification. Surprisingly, the rules will only require commercial, small UAS operators to take an initial knowledge test, followed by a renewal test every 24 months thereafter. As the FAA is primarily tasked with ensuring safety, this proposed ruling will likely be hotly contended in the coming public comment period. Determining the sufficient training and certification requirements for UAS operators is crucial to ensuring the safety of people and property in the air and on the ground as this new field continues its exponential growth.

**Project goals/objectives:** The purpose of the proposed research is to identify how to best train individuals to successfully and safely operate UASs. These findings will assist FL Tech with training students that enroll in the UAS minor and affiliated courses. It will also provide the researchers with a means of publishing UAS research to strengthen future external grant applications in UAS research.

1-**Identify the optimal method for training UAS operators.** The objectives of this goal is to test different methods for effectiveness in training UAS operators. This will be achieved by placing test participants in one of two groups. Group A will be trained on selected tasks using CoA’s UAS simulation software. Once the participants have successfully completed the tasks within the simulation, the participants will be tested on the same tasks using a CoA UAS to determine if transfer of training occurred from the simulated to real-world environment. Group B will train and test only in a
In other words, no simulation training will occur in Group B. During the test, the task times and errors for each participant tested in the real-world will be recorded and a transfer efficiency ratio (TER) identified for each method to determine the better method.

2-Contribute towards an existing gap in the literature regarding the best method to train UAS operators. The objective is to identify if operators learn effectively in a simulated environment. Learning in a simulated environment reduces training costs, minimizes safety incidents from limited operator experience and minimizes the replacement costs of damaged UASs.

3-Understand if pilots and non-pilots differ in performance. Participants recruited will be selected from a population of both pilots and non-pilots from the university. The objective for this goal is to identify if UAS operators should be operationally certified.

Distinct from the PI’s current area(s) of research: The three researchers are either pilots or have a human factors background. The CoA recently purchased equipment producing a UAS Lab. Human factors research in aviation have been previously performed by the researchers but not on UASs.

Information technology (IT): The IT currently exists in the CoA UAS lab and includes Real Flight 7.5 Software, Quanum Nova, and Walkera QR X350 Quadcopter Systems.


Potential External Funding: FAA UAS Center of Excellence

Budget/Justification: $5,000 to hire graduate/undergraduate student research support from the interdisciplinary fields of Human Factors, Aviation Management, Aviation Science, and Aerospace Engineering. Previous ACITC funding was given to Julie Moore in which her travel grant was utilized for the International Conference on UAS (fee and affiliated travel). Previous ACITC funding was given to Debbie Carstens for educational studies that both produced a journal publication.