WTIC Research at Embry-Riddle Aeronautical University

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2011 Developed NEXRAD Course to train GA Pilots (Roberts et al., 2011)

2012 Designed NEXRAD Convective Wx training module (Roberts et al., 2011)

2013 Validated NEXRAD Convective Wx training module with GA Pilots

2014 Transformed the NEXRAD course into an online training module (FAASafety.gov)

2015 -Developed 113 test questions to assess aviation wx knowledge of GA pilots
-Validating assessment with 300 GA pilots
2011-2013 NEXRAD Course

Needs Analysis

Pilot Discussion Boards, meetings, etc.

NEXRAD Course

2.5-hour instructor-based training course

Course Topics

Thunderstorms, Radar basics/Products, NEXRAD, Decision making

Results

All GA Pilots who took course earned higher knowledge test scores after taking the course than those who did not
2014 Online Training Module

**Motivation:** Dry PowerPoints aren’t as effective as interactive online scenario courses in teaching pilots about wx

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**The Atmosphere**
- **Thermosphere:** a thermal classification of the atmosphere. In the thermosphere, temperature increases with altitude.
- **Exosphere:** the outermost layer of the Earth's atmosphere. The exosphere goes from about 400 miles (640 km) high to about 800 miles
- **Ionosphere:** it contains many ions and free electrons
- **Mesosphere:** is characterized by temperatures that quickly decrease as height increases.

**Clouds**
- **How do clouds form?**
  - **Cirrus:** Thin, wispy, filamentous, or curly
  - **Strato-cumulus:** Broad and flat on the bottom, puffy on top
  - **Stratus:** Uniform, flat, thick to thin layered clouds will ill-defined edges

**Decision Making**
- **D:** Detect
- **E:** Estimate
- **C:** Choose
- **I:** Identify
- **D:** Do
- **E:** Evaluate

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**Excerpts from interactive online scenario courses:**

- [http://canvaslib.erau.edu/coa-flight/wtic/03NEXRAD/story.html](http://canvaslib.erau.edu/coa-flight/wtic/03NEXRAD/story.html)
- [http://canvaslib.erau.edu/coa-flight/wtic/10Scenario02/story.html](http://canvaslib.erau.edu/coa-flight/wtic/10Scenario02/story.html)
2015-Assessing Aviation Wx Knowledge

- Developed 113 test questions to assess aviation wx knowledge of GA pilots
- Validating assessment with 300 GA pilots

https://youtu.be/Z7g0AycOrzw
2015-Assessing Aviation Wx Knowledge

Psychometric Properties

Content Validity

Discrimination Index

Reliability

Criterion Validity

Discriminates between those with low and high wx knowledge.

Does the test predict GA pilot performance?

Test comprehensiveness

Test consistency & repeatability
Future Wx Training for Pilots

https://youtu.be/I05fsP-bLxU
Take Aways

• Are GA pilots accurately assessed on aviation weather knowledge and skills?
  -113 question assessment and test validation helps to answer question

• There is more we can do to train GA pilots about weather and technology

• Goal: Create dynamic, self-study scenarios that provide instant feedback in a cost-effective manner.