

## Development of Critical Thinking Skills In Collegiate Aviation Programs

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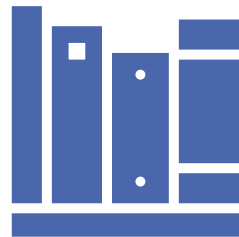
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# Development of Critical Thinking Skills in Collegiate Aviation Programs

Irene Miller, Ed.D, C.M.

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# Purpose of the Study

Students must be able to:



Define critical thinking



Identify specific critical thinking skills

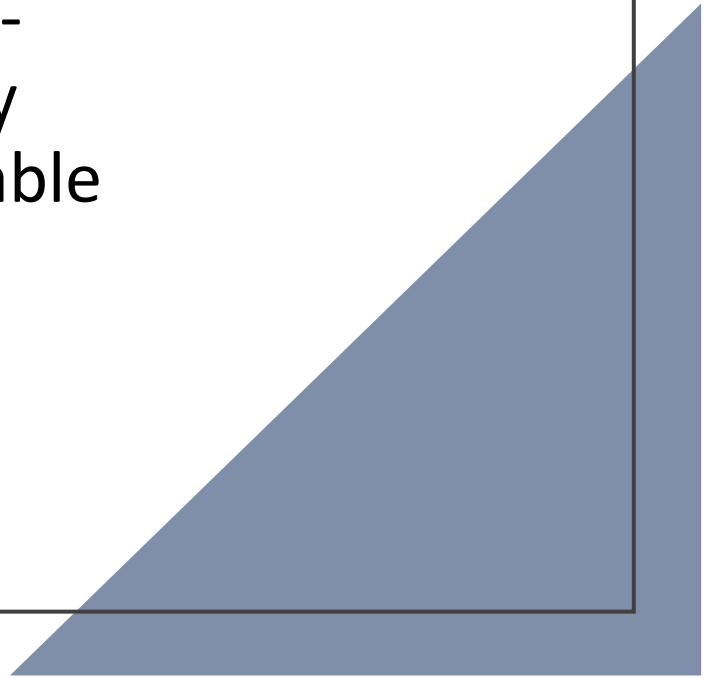


Apply critical thinking skills in the aviation industry



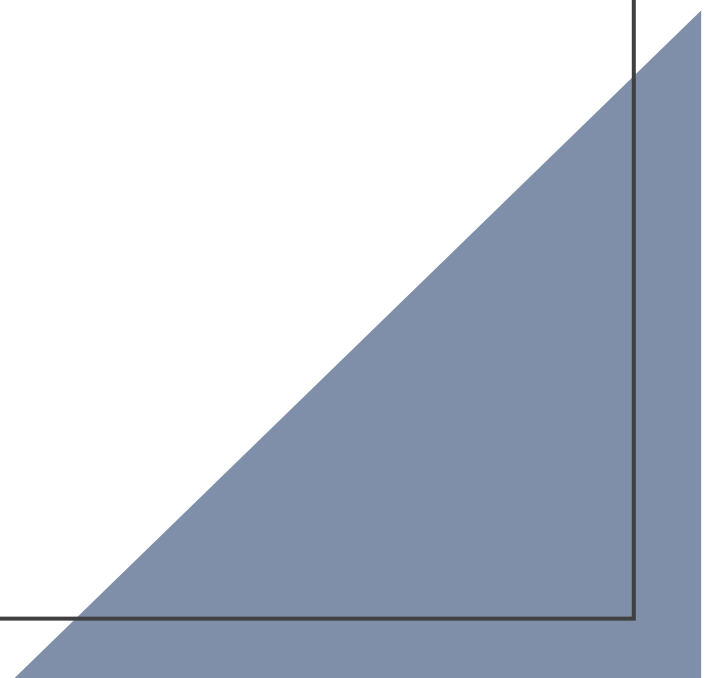
# Research Questions

- RQ2
  - Did the collegiate aviation students achieve higher scores on specific portions of the post-course critical thinking assessment to identify specific critical thinking skills students were able to develop because of the pedagogical techniques used in the classroom?

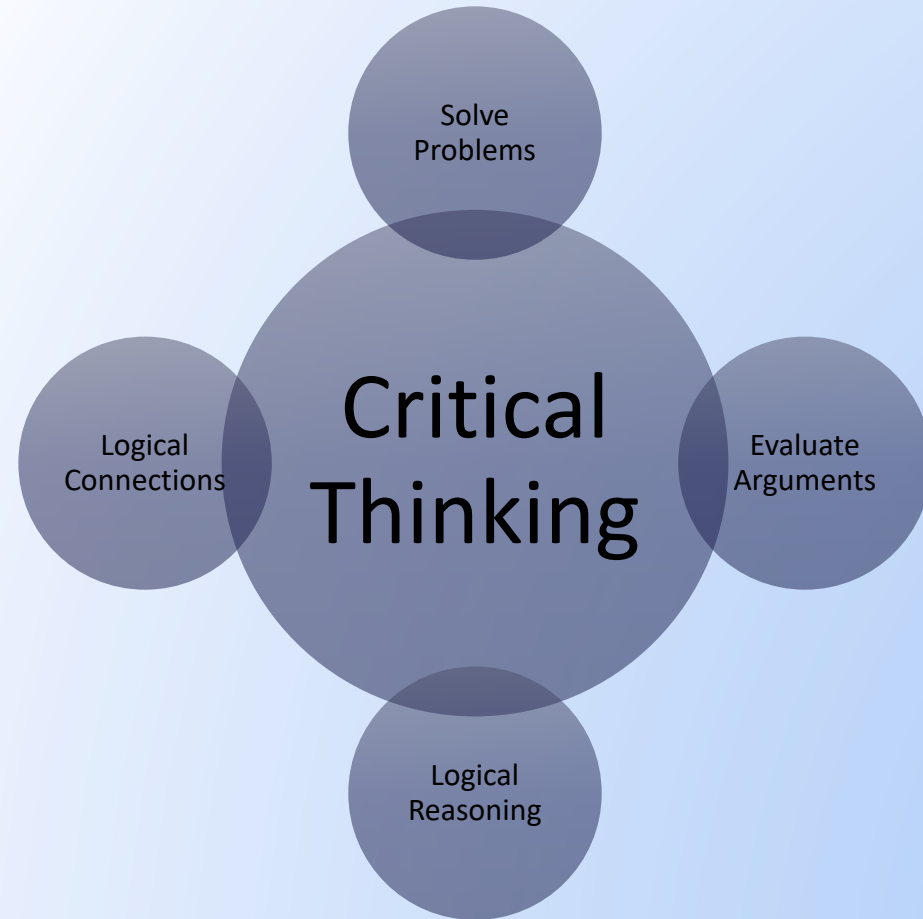


# Research Questions

- RQ1
  - Can collegiate aviation students increase their critical thinking skills through pedagogical techniques used within the classroom as demonstrated by the achievement of higher scores on the post-course critical thinking assessment than on the pre-course critical thinking assessment?



# Why are critical thinking skills important within the aviation industry?



# Methodology

Mixed  
Methodology

Participants

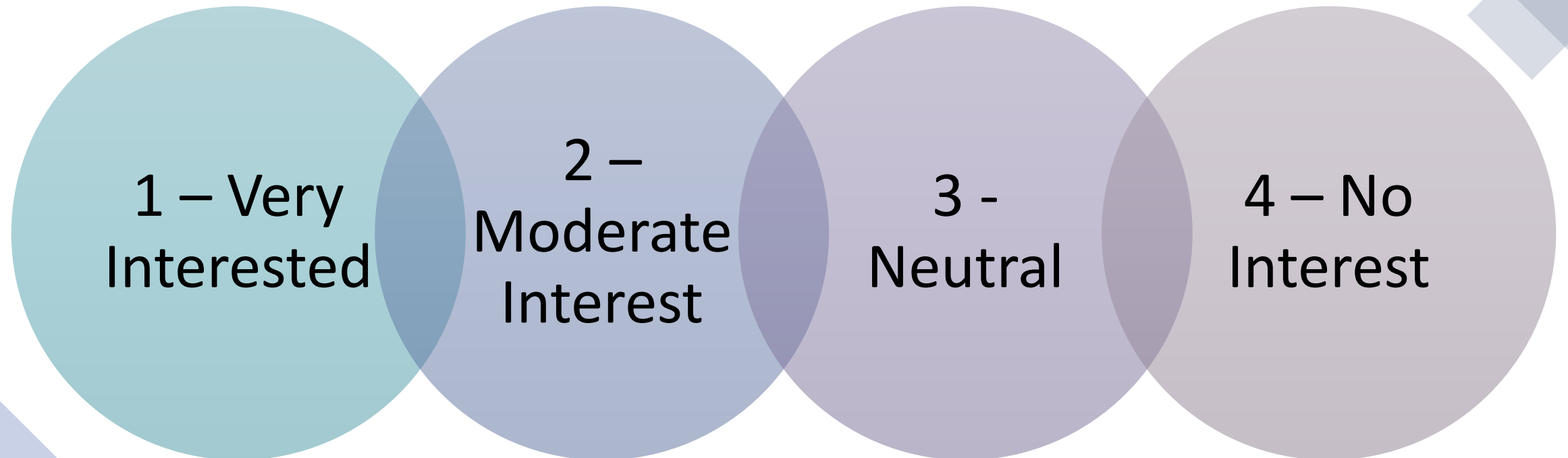
27 Students

Research  
Instruments

Pre-Course  
Survey

Pretest &  
Posttest

# Scale to Quantify Level of Interest





# Pre-Course Survey

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- Q11 - Level of interest in critical thinking skills
  - 75% - High to moderate level of interest
- Q13 – Usefulness of critical thinking skills in their careers
- Q14 – Career plan
  - Professional pilot
- Q17 – Level of interest in pursuing a graduate degree
  - 50% - Intend to pursue an aviation-related graduate degree



# Pretest & Posttest

- Critical Thinking Skills Assessment
  - Watson-Glaser Critical Thinking Appraisal
    - Inferences – 16 questions
    - Assumptions – 20 questions
    - Deduction – 16 questions
    - Interpretation – 15 questions
    - Evaluating arguments – 16 questions

# Critical Thinking In-Class Activities



## **Cognitive activities**

Abstract reasoning skills  
Inductive reasoning skills



## **Boeing 737 Max case analysis**



## **In-class activities**

Fact or opinion  
Think “outside the box”

# Critical Thinking Skills Curriculum

## Part 1

- Definition of critical thinking
- Reasons why critical thinking is important in the aviation industry
- Critical thinking assessments used by employers

## Part 2

- Five components of critical thinking
- Definition of Higher Order Thinking Skills (HOTS)
- Bloom's taxonomy

**Table 2**  
*Pair Samples Statistics*

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Inferences T1	39.0500	20	12.25808	2.74099
	Inferences T2	32.3500	20	9.18967	2.05487
Pair 2	Assumptions T1	65.5000	20	20.38446	4.55810
	Assumptions T2	61.2500	20	18.62900	4.16557
Pair 3	Deduction T1	74.5500	20	19.59451	4.38147
	Deductions T2	79.3000	20	15.94101	3.56452
Pair 4	Interpretation T1	68.1000	20	20.38291	4.55776
	Interpretation T2	71.4500	20	15.35021	3.43241
Pair 5	Evaluating Arguments T1	60.7500	20	19.68936	4.40268
	Evaluating Arguments T2	56.6000	20	19.48657	4.35733
Pair 6	Total Score T1	61.6000	20	10.65932	2.38350
	Total Score T2	59.8000	20	11.38605	2.54600

A small white propeller airplane with registration N731T is parked on a runway. The scene is set during sunset or sunrise, with a bright sun low on the horizon and a sky filled with scattered clouds. The airplane is the central focus, with its registration number clearly visible on the fuselage. Other smaller aircraft are visible in the background on the left.

# Conclusions

- RQ1
  - No statistical difference in pretest and posttest overall scores
- RQ2
  - Deduction and interpretation section scores were slightly higher on posttest
  - Inference section score was lower on posttest



# Recommendations

- Scores on the inference portion of the posttest showed significant decline.
  - Inferences are difficult to learn and are similar to interpretations
- Limitations of uncontrollable variables
  - Student motivation and commitment
  - Include critical thinking materials in the course assessments
  - Posttest was administered on the last day of class





Questions