Cockpit Commander

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Agenda

- Recap of Research Project
- Equipment Used
- Dependent and Independent Variables
- Declarative and Procedural Knowledge
- Method (DOE)
- Initial Data Comparison
- Results and Input
- Adjustments if Executing
- Questions / Comments
- References

Research Problem

- Will training in a VR environment provide a more efficient method of flight training in novice pilots?
- What differences will be apparent with the comparison of VR and PowerPoint training?

Hypothesis

- PowerPoint : Will provide more transfer of declarative knowledge than VR.
- VR: Will provide more understanding how to operate the plane rather than a PowerPoint.
- A combination of a PowerPoint training along with the VR simulation could promote better scores than one or the other.

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Dependent Variable

The dependent variable will be the level of understanding(success) the participant has of basic aerial maneuvers. We will measure this by using a checklist that an IP(instructor pilot) will implement to judge if the participant performed the maneuver within standards. We will calculate the averages of both categories and use this number to compare the efficiency of each training.

Independent Variable

The independent variable is the method of training. The methods of training include a PowerPoint presentation and a flight simulation through Vive eye pro. Each method of training provides a different method of learning. The power point supports the declarative knowledge area of the training. For instance, the power point provides "written" knowledge of the basic maneuvers the participants will complete. The simulation (Vive Eye Pro & Simulated Chair) provides procedural knowledge for the participant. The simulation trains the user how to physically complete the maneuvers without providing declarative knowledge like the PowerPoint. Understanding the two differences of these methods will help us measure the success level of the training.

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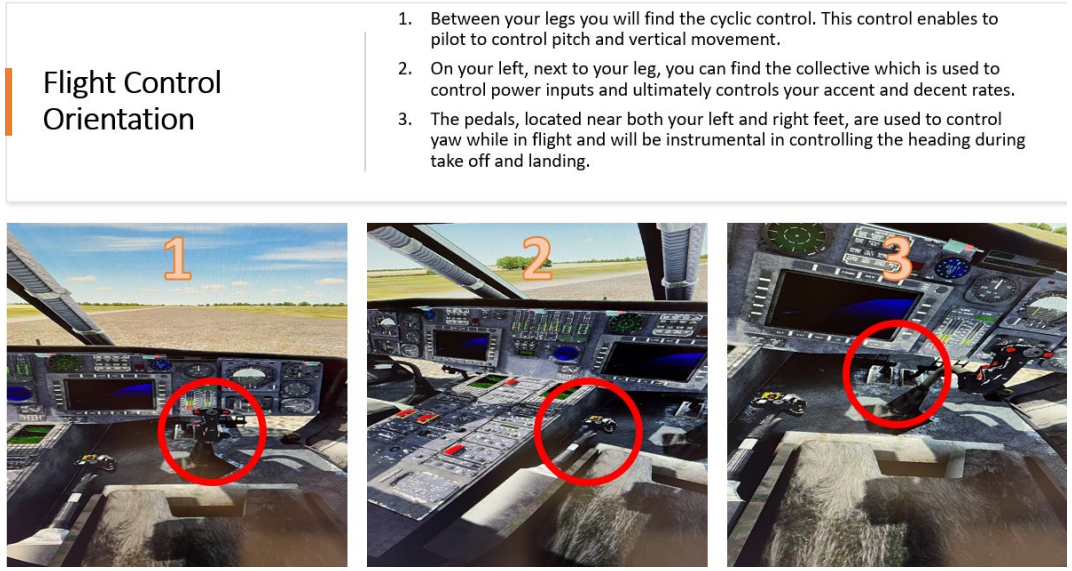
Equipment Used

- PPT
- Vive Pro
- Helimod
- Surveys
  - Demographic
  - SSQ
- Grade sheet

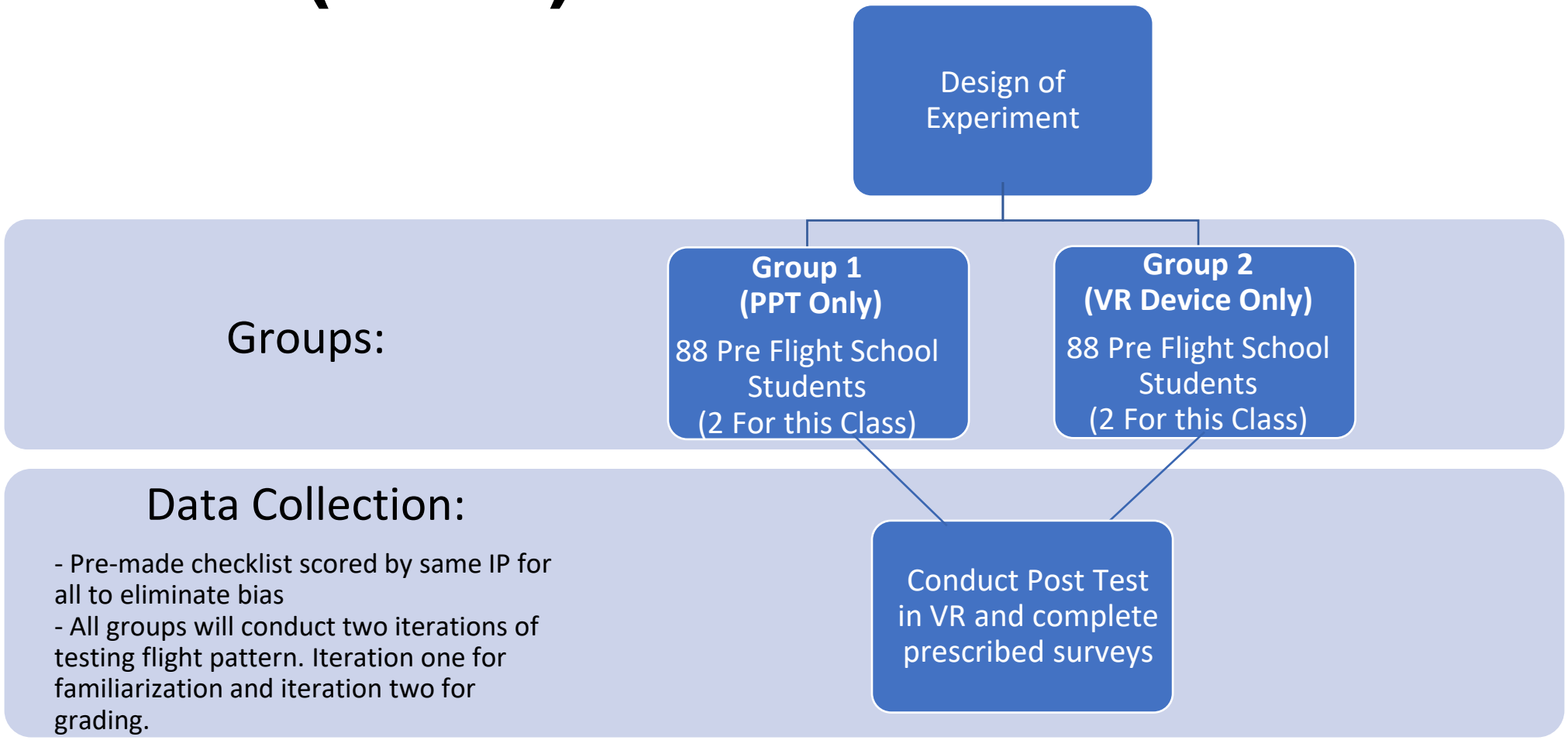
Declarative vs. Procedural Knowledge



- Declarative Knowledge
  - Related to cognition of facts/information
  - Utilizes conscious attention to recall information even once coded
  - Ability to describe things/processes/events

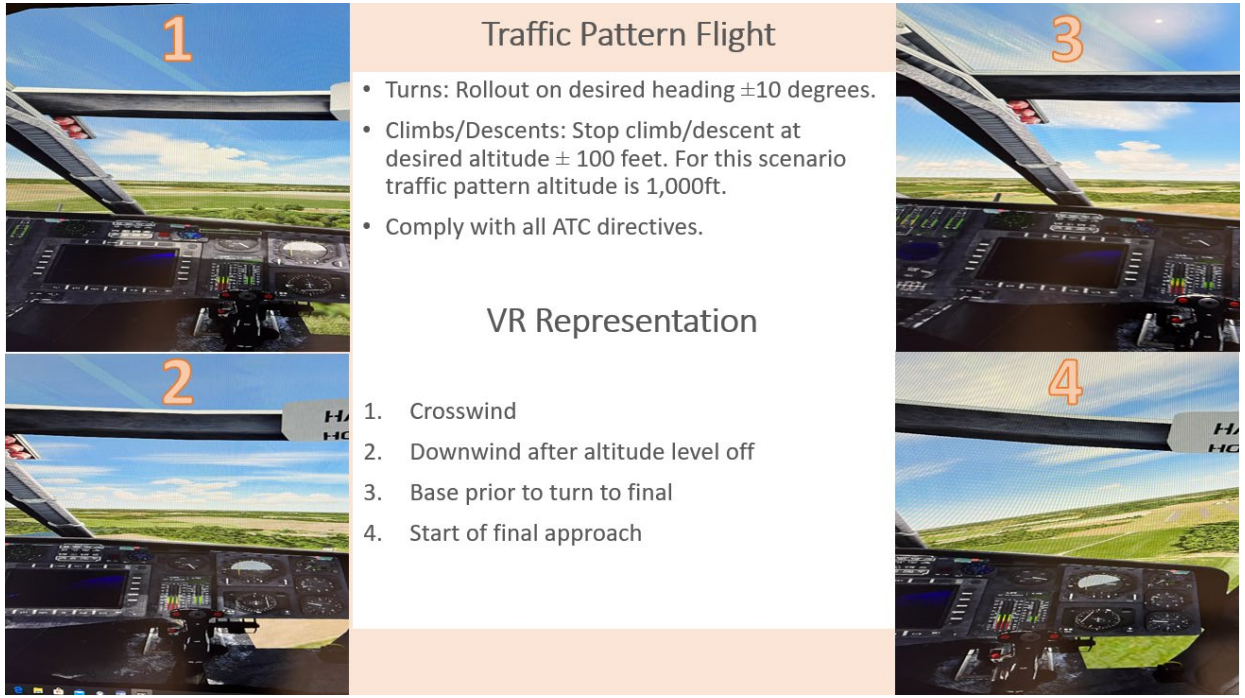
- Procedural Knowledge
  - Related to steps necessary to complete task
  - Does not necessarily require conscious attention once encoded
  - Ability to perform a given task

Methods (DOE)


Design of Experiment
Groups:
Group 1 (PPT Only)
88 Pre Flight School Students (2 For this Class)
Group 2 (VR Device Only)
88 Pre Flight School Students (2 For this Class)
Data Collection:
- Pre-made checklist scored by same IP for all to eliminate bias
- All groups will conduct two iterations of testing flight pattern. Iteration one for familiarization and iteration two for grading.
Conduct Post Test in VR and complete prescribed surveys

Group (DOE) Explanation

GROUP 1



GROUP 2

Demographics of Sample						
	Male	Female	WO1-CW2	2LT-CPT	PPT	VR
N	3	1	1	3	2	2
%	75	25	25	75	50	50

Early Results and Input

- All participants passed overall assessment with only one participant passing all maneuvers. (Average = 90%)
- 3 of 4 had weekly to monthly participation in computer games
- 2 participants with novice VR experience (played less than 10 times prior)
- 2 participants with intermediate VR experience (play more than 10 times but less than 100 times)
- Participants understood flight expectations however PPT group seemed to have less control touch
- All participants struggled with trim in all maneuvers

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Initial Data Comparison

Instructor Pilot Input		
Measure	**Group 1 (PPT)**	**Group 2 (VR)**
Overall Assessment	Fam flight was a must. Very apparent learning curve to understand VR capability, however both participants understood expectations. Safe on controls but choppy inputs causing overcorrections and IP corrections to pass. Consistantly out of trim and had challenges with altitude changes.	Both understood expectations however one participant seemed uncomfrotable on their location in the traffic pattern realative to the aircraft. Both participants out of trim most fo the flight.
VMC Take Off	Trim only concern. Failure by both participants however did not casue unsafe flight profile.	Participant 3 very good for experience level. Participant 4 is safe but needs continued training.
Traffic Pattern	Both participants porpused in climbs and decents. Participant 2 out of tolerance and had to be corrected multiple times.	Participant 4 turns late and is uncomfrotable with aircraft location realitive to pattern.
VMC Approach to Ground	Safe but not smooth. At experience level	Good work by both. Comfort seemed to increase as flight went on.
Participant scores	Participant 1 = 9/10; Participant 2 = 8/10	Participant 3 = 10/10; Participant 4 = 8/10

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Adjustments if Executed

- Continue to develop scenarios
  - Trim was not part of the initial design
- Incorporate Exit Survey
- Technology Acceptance Model (TAM) instead of NASA TLX
- Develop with Agile approach to incrementally increase effectiveness

Questions/Feedback

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