

Mar 2nd, 9:30 AM - 10:45 AM

Preliminary Results of a Study Investigating Aviation Students' Intentions to use Virtual Reality for Flight Training

Stephanie G. Fussell
Embry-Riddle Aeronautical University, sfussel2@kent.edu

Follow this and additional works at: <https://commons.erau.edu/ntas>



Part of the [Educational Technology Commons](#), and the [Science and Mathematics Education Commons](#)

Fussell, Stephanie G., "Preliminary Results of a Study Investigating Aviation Students' Intentions to use Virtual Reality for Flight Training" (2020). *National Training Aircraft Symposium (NTAS)*. 15.
<https://commons.erau.edu/ntas/2020/presentations/15>

This Presentation is brought to you for free and open access by the Conferences at Scholarly Commons. It has been accepted for inclusion in National Training Aircraft Symposium (NTAS) by an authorized administrator of Scholarly Commons. For more information, please contact commons@erau.edu.



**PRELIMINARY RESULTS OF A STUDY
INVESTIGATING AVIATION STUDENT'S
INTENTIONS TO USE VIRTUAL REALITY FOR
FLIGHT TRAINING**

STEPHANIE G. FUSSELL, PHD CANDIDATE

DR. DOTHANG TRUONG, CHAIR

DR. DAVID CROSS, DR. ROBERT THOMAS, DR. CHANG-GEUN OH, COMMITTEE MEMBERS



OUTLINE

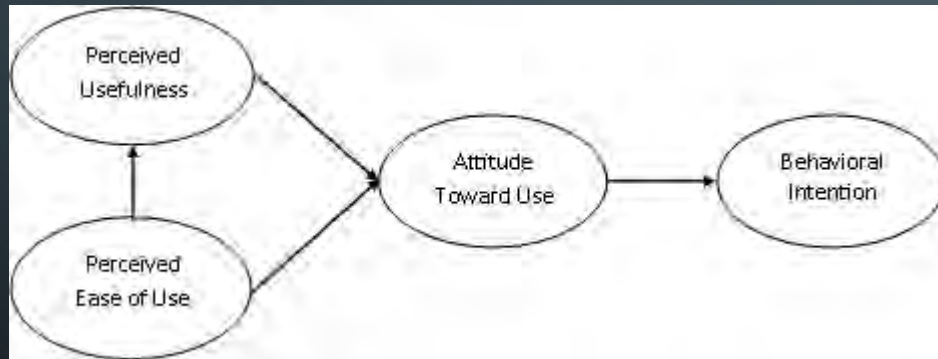
- Background
- Research Questions & Purpose
- Proposed Research Theoretical Framework and Hypotheses
- Survey Instrument
- Results of the Pilot Study
- Discussion & Next Steps

AVIATION, VR, AND EDUCATION



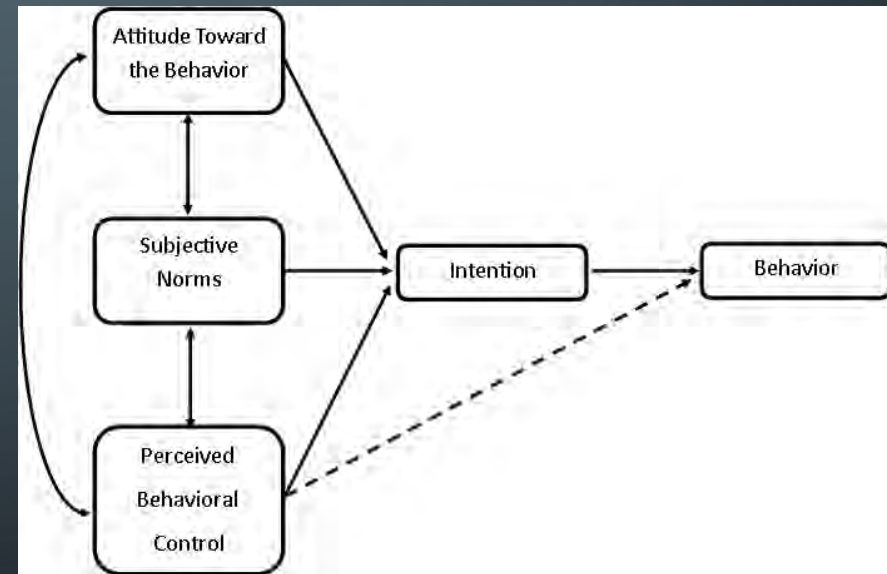
FOUNDATION THEORIES OF THE STUDY

TECHNOLOGY ACCEPTANCE MODEL (TAM)



Davis, Bagozzi, and Warshaw (1989)

THEORY OF PLANNED BEHAVIOR (TPB)



Ajzen (1991)

RESEARCH QUESTIONS & PURPOSE



What factors influence aviation students' intentions to use VR technology for flight training?

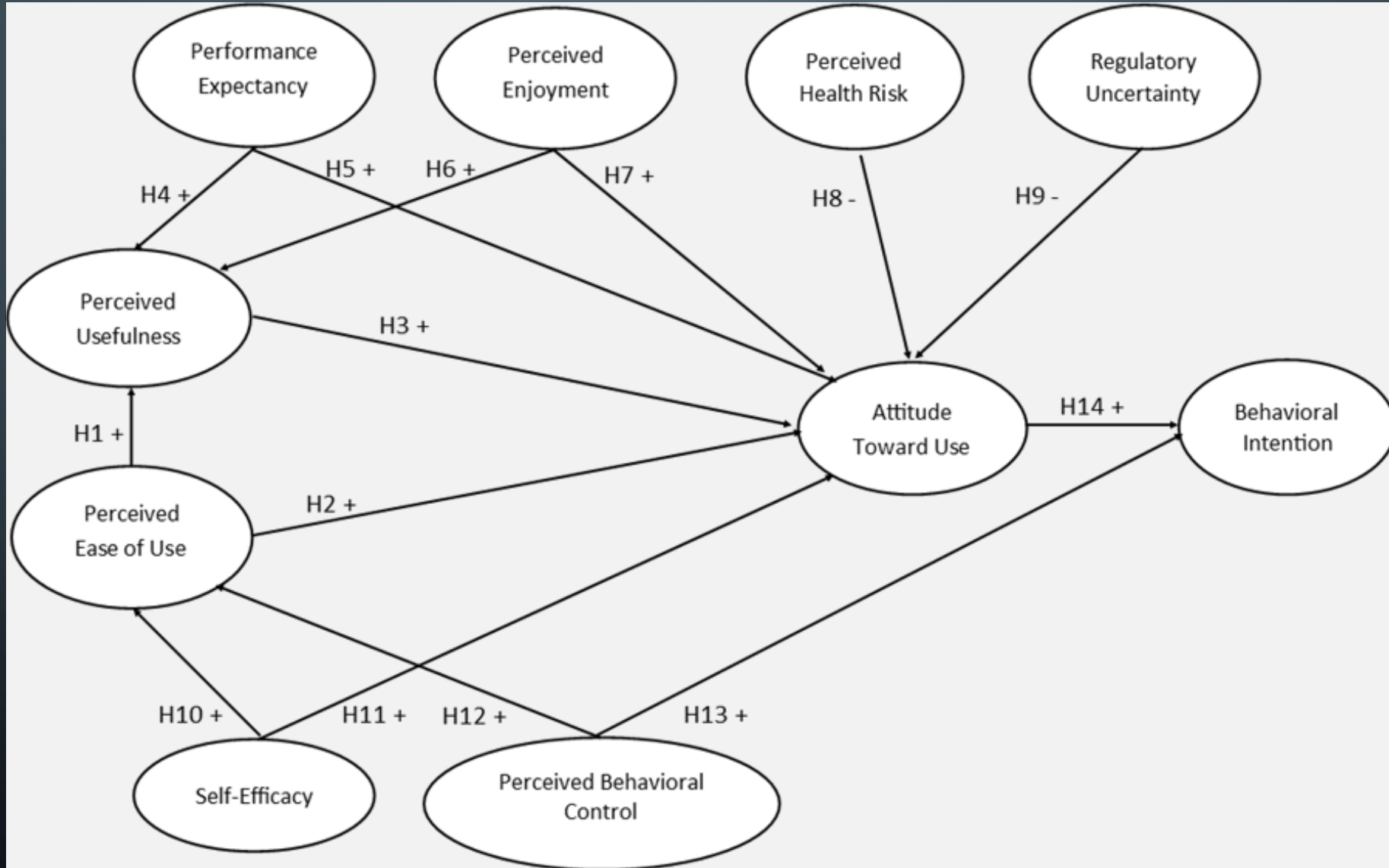


How do these factors impact students' intentions to use VR technology for flight training?



To what extent do these factors influence aviation students' intentions to use VR technology for flight training?

PROPOSED RESEARCH THEORETICAL FRAMEWORK AND HYPOTHESES



SURVEY INSTRUMENT



Designed using foundation theories and previous, validated instruments



Accessed via email with link to online survey platform



Section 1: purpose of study, consent form, screening questions



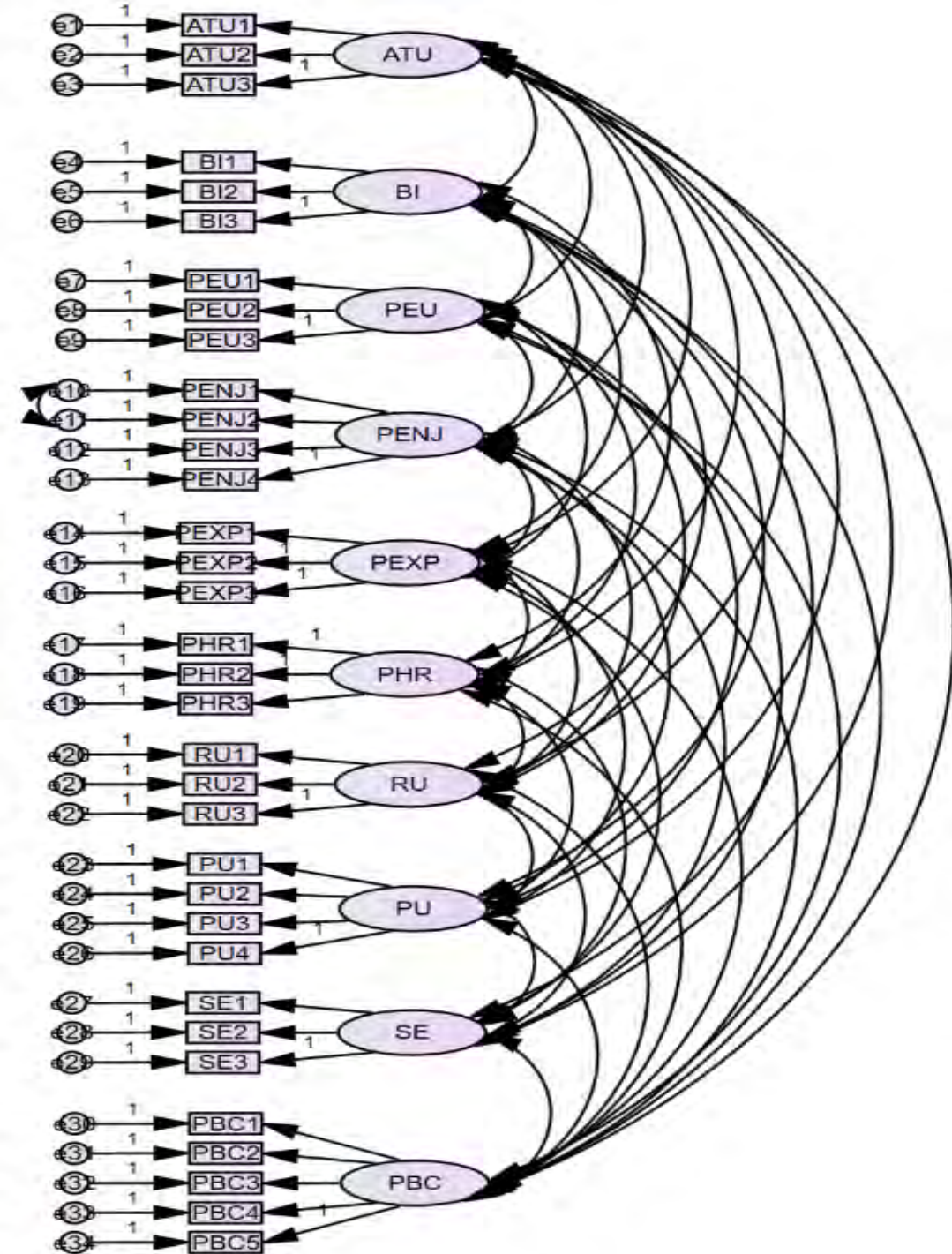
Section 2: demographic data (11)



Section 3: Likert response items to assess latent constructs (34)

RESULTS OF THE PILOT STUDY: CFA AND SEM RESULTS

- Factor Perceived Health Risk (PHR) had low Cronbach's alpha value of 0.40; changes required
- Factor Regulatory Uncertainty (RU) had low construct reliability of 0.67 but acceptable low Cronbach's alpha value; no change required



RESULTS OF THE PILOT STUDY

| | N | Mean | Std. Deviation | Skewness | Kurtosis |
|----------|----|------|-------------------|----------|----------|
| ATU_All | 42 | 3.76 | 1.21 | -0.74 | -0.13 |
| BI_All | 42 | 3.59 | 1.20 | -0.62 | -0.40 |
| PEU_All | 42 | 3.45 | 1.06 | -0.29 | -0.21 |
| PENJ_All | 42 | 3.88 | 1.00 | -0.78 | 0.37 |
| PEXP_All | 42 | 3.02 | 0.93 | -0.05 | -0.09 |
| PHR_All | 42 | 2.83 | 0.82 | -0.06 | -0.71 |
| RU_All | 42 | 3.07 | 1.01 | -0.15 | -0.16 |
| PU_All | 42 | 3.34 | 1.07 | -0.34 | -0.08 |
| SE_All | 42 | 3.58 | 1.03 | -0.50 | 0.21 |
| PBC_All | 42 | 3.44 | 1.05 | -0.25 | -0.68 |

RESULTS OF THE PILOT STUDY

| | | BI_All | ATU_All | PEU_All | PENJ_All | PEXP_All | PHR_All | RU_All | PU_All | SE_All | PBC_All |
|---------|---------------------|--------|---------|---------|----------|----------|---------|--------|--------|--------|---------|
| BI_All | Pearson Correlation | 1 | .841** | .805** | .643** | .614** | .030 | -.212 | .785** | .420** | .531** |
| | Sig. (2-tailed) | | .000 | .000 | .000 | .000 | .850 | .178 | .000 | .006 | .000 |
| ATU_All | Pearson Correlation | .841** | 1 | .762** | .581** | .512** | .079 | -.072 | .763** | .367* | .400** |
| | Sig. (2-tailed) | .000 | | .000 | .000 | .001 | .619 | .649 | .000 | .017 | .009 |
| | N | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 |

Coefficient

Relationship

Between +0.35 and -0.35

Weak or none

Between ± 0.35 and ± 0.65

Moderate

Between ± 0.65 and ± 1.0

Strong

DISCUSSION AND NEXT STEPS



Potential support of original TAM factors: PEU, PU, ATU, and BI



Potential support of factors supported by the literature: PENJ, PEXP, PBC, and SE



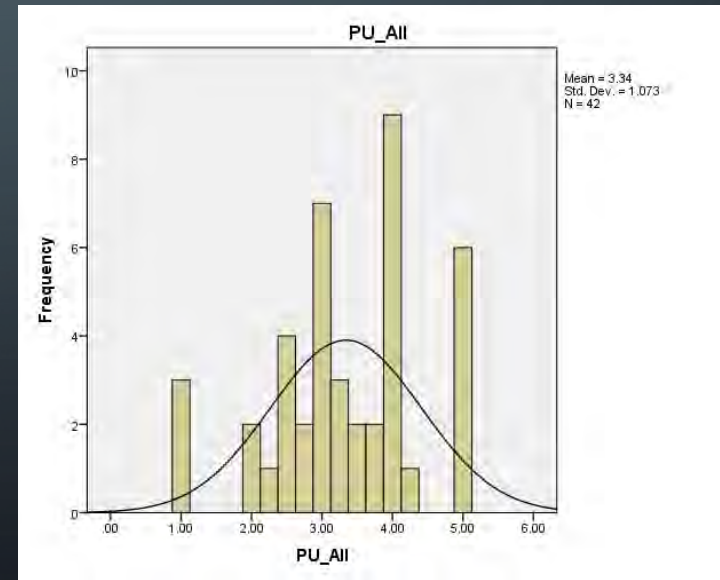
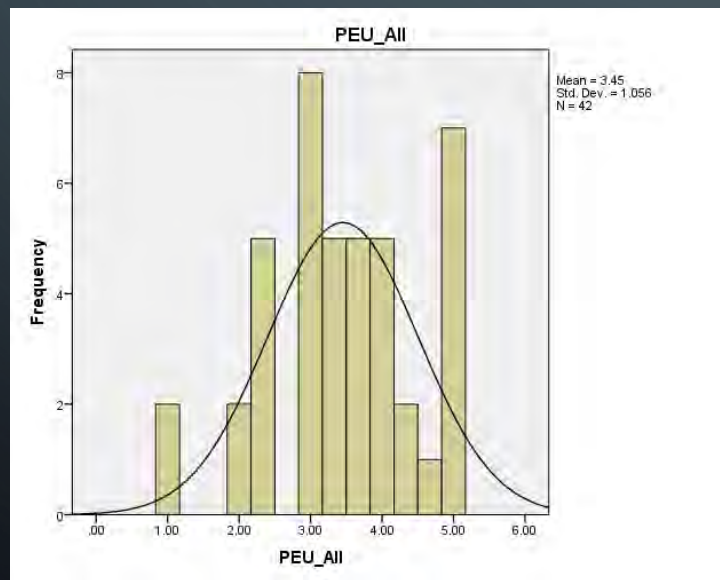
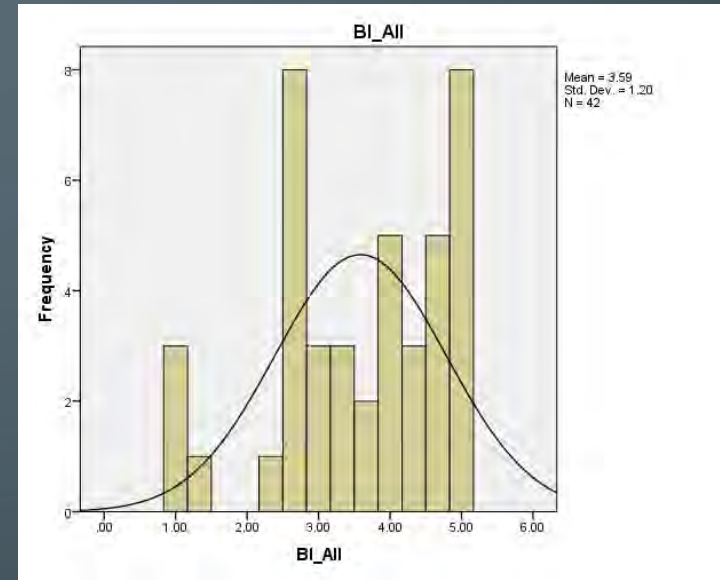
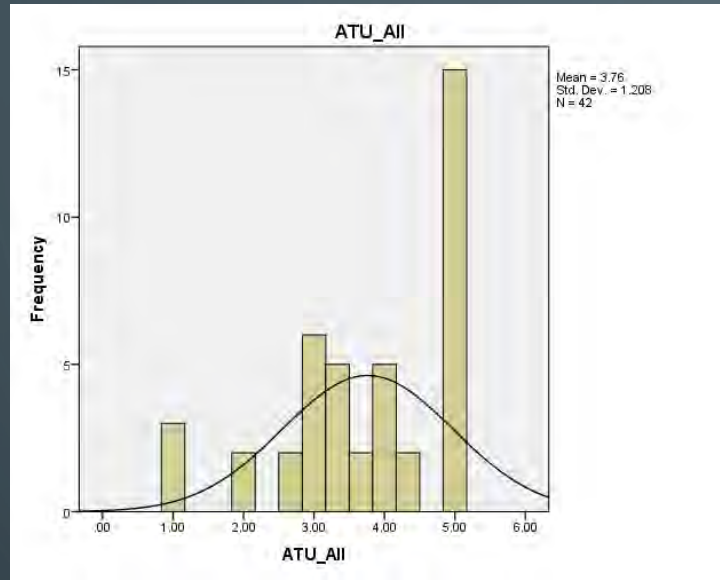
Potential lack of support of new factors for the model: PHR and RU



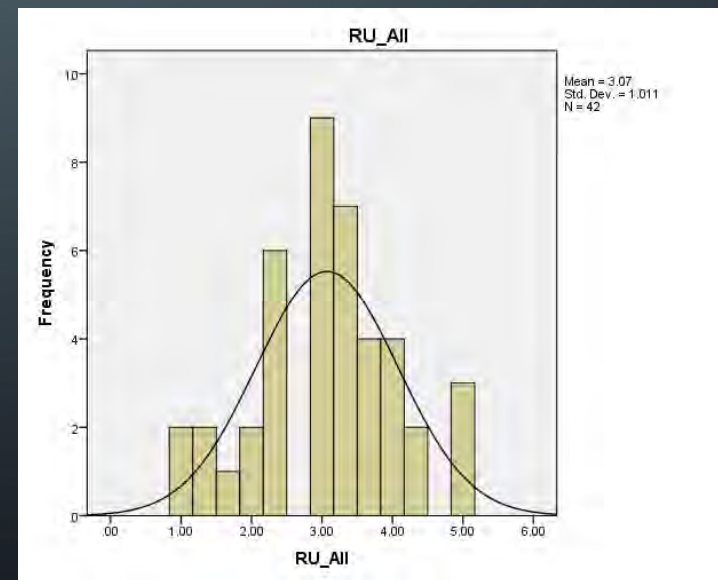
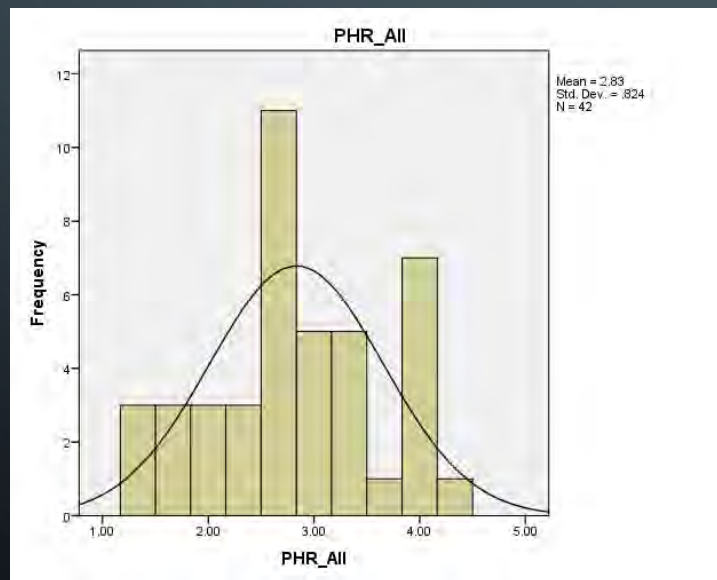
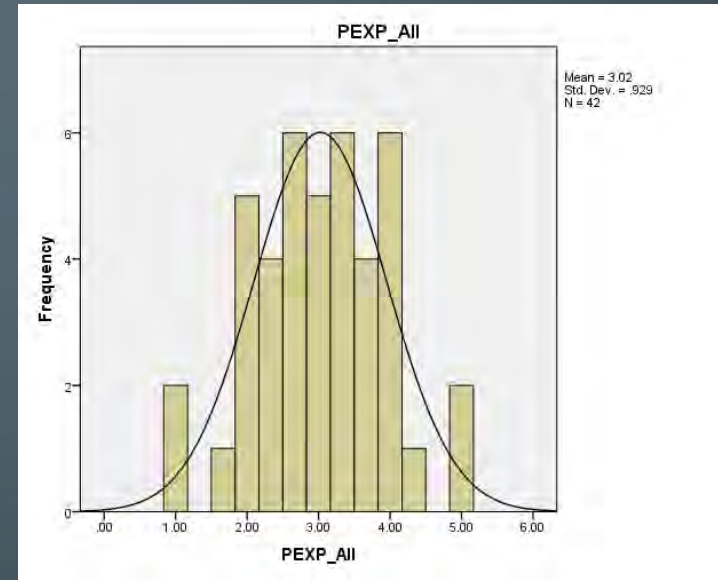
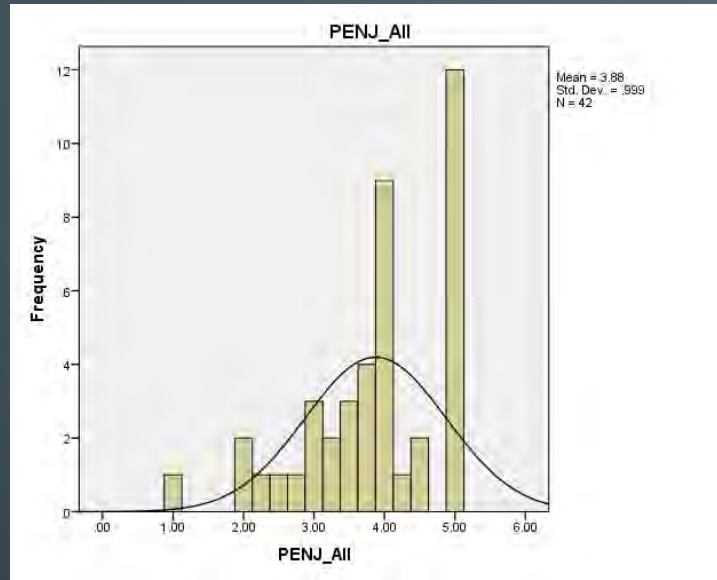
QUESTIONS, COMMENTS,
CONCERNS?

THANK YOU.

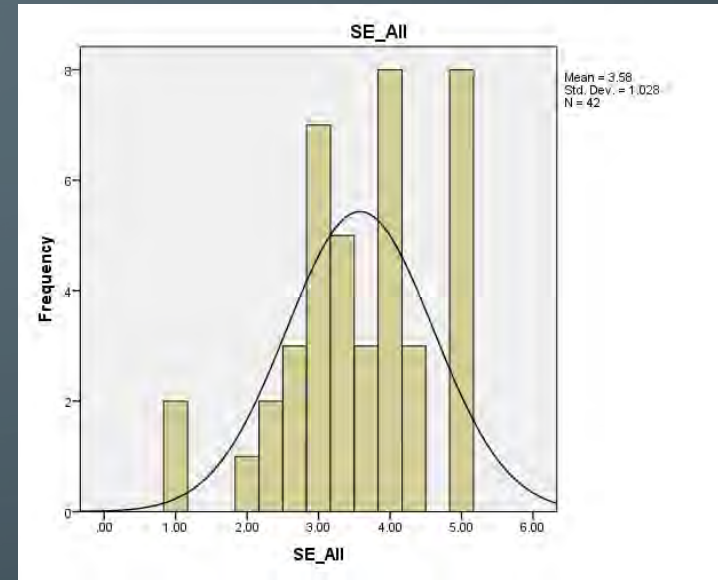
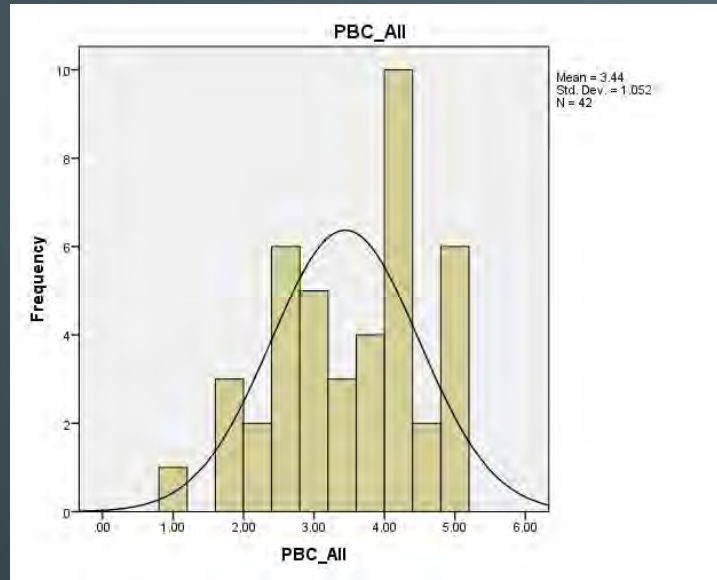
HISTOGRAMS OF ATU, BI, PEU, & PU



HISTOGRAMS OF PENJ, PEXP, PHR, & RU



HISTOGRAMS OF PBC & RU



OPERATIONAL DEFINITIONS OF THE PROPOSED MODEL CONSTRUCTS

| Factor | Definition |
|------------------------------|---|
| Attitude toward use | The degree to which a student has a favorable or unfavorable appraisal or evaluation of VR for flight training. |
| Behavioral intention | An indication of how hard a student is willing to try or how much effort they are planning to exert in order to use VR for flight training. |
| Perceived behavioral control | The extent to which an aviation student feels able to control using VR technology for flight training. |
| Perceived ease of use | The degree to which a student believes that using VR for flight training would be free of effort. |
| Perceived enjoyment | The degree to which using VR for flight training is perceived to be enjoyable in its own right apart from any performance consequences that may be anticipated. |

| Factor | Definition |
|------------------------|---|
| Performance expectancy | The degree to which a student believes that using VR for flight training will improve flight performance as compared to an FTD. |
| Perceived health risk | The perception a student forms and revises based on the possible health risks of using VR for flight training. |
| Perceived usefulness | The degree to which a student believes that using VR for flight training would enhance his or her performance. |
| Regulatory uncertainty | The degree to which the lack of FAA regulations regarding the use of VR for flight training impacts attitude toward the technology. |
| Self-efficacy | Perception of one's flight skills in the virtual and real-world environments. |