

## Validation of Training Satisfaction Survey

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# Validation of Training Satisfaction Survey

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# Why Develop the Survey?

The researchers in the College of Aviation are undertaking many new virtual reality projects; especially VR training to recognize visual illusions

How do you measure training success?

- Knowledge
- Self-Efficacy
- Training satisfaction survey (TSS)

# Training Satisfaction

Many studies/references have shown that enjoyable training methods lead to more effective learning

(Giannakos, 2013; Kirkpatrick, 2016; Long, 2005; Lin, 2020; Rano, 2018; van Limpt, 2020)

Had a hard time finding a TSS that “fit” new VR environment & application

Decided to validate our own TSS

# Development of the Survey

Began with a literature review focusing on **training satisfaction** and **potential uses in Virtual Reality**

Decided on a Likert Scale Survey

Searched through already validated surveys statements that would fit our VR training applications

Produced statements in 3 categories:

- **Enjoyment, relevance, and technical satisfaction**
- Also, some open-ended questions for more detailed feedback

# The Survey

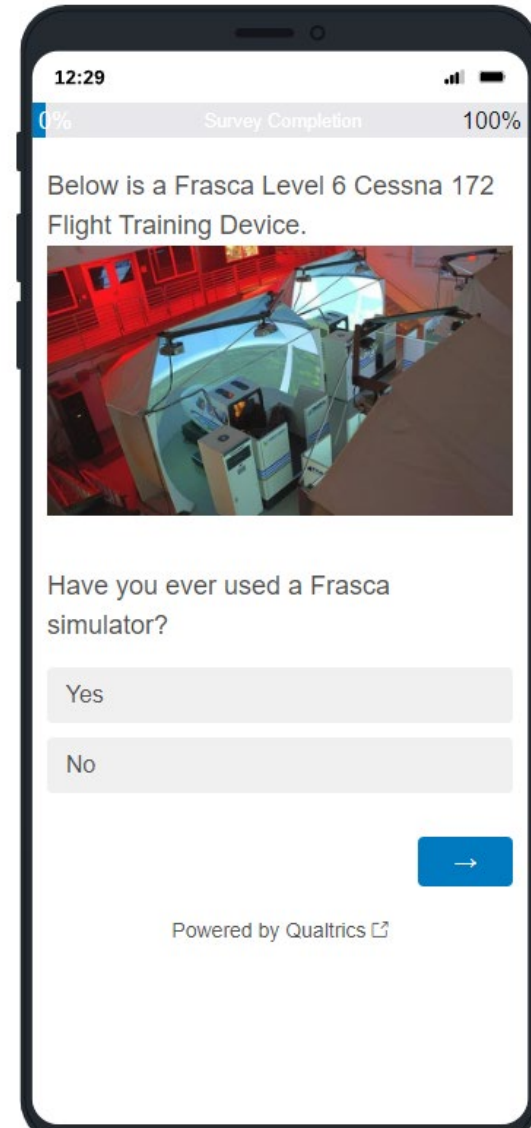
Below is a Frasca Level 6 Cessna 172 Flight Training Device.



Have you ever used a Frasca simulator?

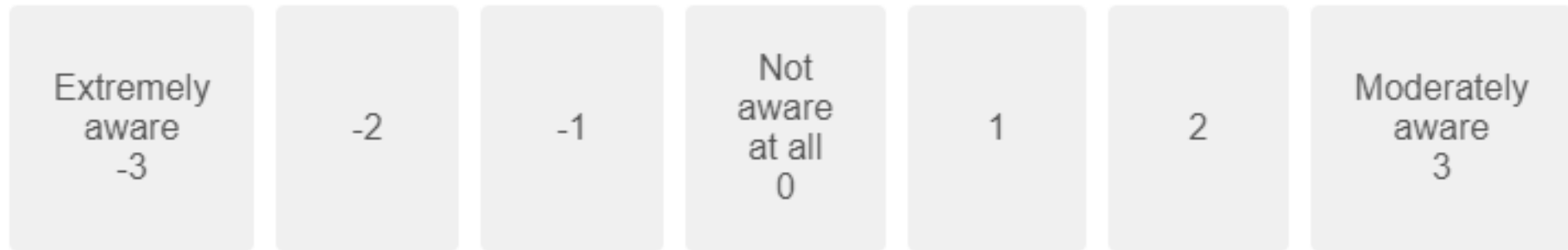
Yes

No



# The Survey

How aware were you of the real world surrounding while navigating in the virtual world (I.e., sounds, room temperature, other people, etc.)?



# Items from the Literature

|                               | Items   |
|-------------------------------|---|
| <b>Enjoyment</b>              | I enjoyed the training very much. (Fergonese, 2018)                                       |
|                               | I am satisfied with the quality of training provided? (Morgan, 2000)                      |
|                               | The training material was fun. (Brown, 2005)  |
|                               | This training held my interest. (Kirkpatrick, 2016)                                       |
|                               | I would recommend this training to other students. (Kirkpatrick, 2016)                    |
| <b>Relevance</b>              | I am satisfied with the relevance of training received to flight tasks. (Morgan, 2000)    |
|                               | I am satisfied with the relevance of the training content to flight tasks. (Morgan, 2000) |
|                               | I will keep the training in good memory. (Fergonese, 2018)                                |
|                               | The training provided a useful environment for flight tasks. (Brown, 2005)                |
|                               | The training was relevant to the flight tasks. (Brown, 2005)                              |
| <b>Technical Satisfaction</b> | The lesson was easy to follow. (Kirkpatrick, 2016)  |
|                               | The lesson was easy to navigate. (Kirkpatrick, 2016)                                      |
|                               | The technology interface was easy to use. (Brown, 2005)                                   |
|                               | I am satisfied with the technology interface. (Brown, 2005)                               |
|                               | The technology allowed for easy review. (Brown, 2005)                                     |
| <b>Overall Satisfaction</b>   | What did you like most about the training? (Dagenais, 2011)                               |
|                               | What did you like least about the training? (Dagenais, 2011)                              |
|                               | Do you have any suggestions to improve the training? (Dagenais, 2011)                     |



# Validation of the Survey

N = 159 Participants

Exploratory factor analysis

- Direct Oblimin
- Kaiser's Criterion

Enjoyment &  
Technology Satisfaction  
**65.25%**

| Question#                                  | Item   | Loading |
|--|--|---------|
| <i>Factor one: Enjoyment</i>               |  |         |
| 13   | I feel that type of training should be required for student pilots.    | 0.921   |
| 11   | I wish I had this type of training when I was learning how to fly.     | 0.918   |
| 12   | I want my students to use this type of training.                       | 0.812   |
| 1  | I enjoyed the training very much.                                      | 0.72    |
| 4  | I would recommend this training to other students.                     | 0.692   |
| 2  | I am satisfied with the quality of training provided.                  | 0.665   |
| 10   | I was satisfied with this type of computer-based learning environment. | 0.61    |
| 9  | I am satisfied with this type of learning experience.                  | 0.52    |
| <i>Factor two: Technology Satisfaction</i> |  |         |
| 5  | The lessons were easy to follow.                                       | 0.908   |
| 6  | The lessons were easy to navigate.                                     | 0.888   |
| 8  | The training was relevant to the training objectives.                  | 0.567   |
| 7  | The training provided a useful environment to learn.                   | 0.525   |
| 3  | This training held my interest.  | 0.513   |

# Summary of Factor Analysis

TSS aimed to measure training satisfaction using three theoretically based subfactors

- Relevance
- Enjoyment technology
- Satisfaction

Data supports a two-factor solution: **enjoyment & technology satisfaction.**

# Summary of Factor Analysis

## Limitations

- Preliminary sample size small

- Scale may have too few items

## Future Studies

- Larger sample size

- Conduct CFA

# References

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# The Survey – Open Ended

## Overall Satisfaction:

- What did you like most about the training? (Dagenais, 2011)
- What did you like least about the training? (Dagenais, 2011)
- Do you have any suggestions to improve the training? (Dagenais, 2011)

# The Survey – Open Ended

| Likes | Fidelity | Low Cost | Practice | Safe Practice | Adaptability | Easy |
|-------|----------|----------|----------|---------------|--------------|------|
| Count | 29       | 23       | 40       | 14            | 8            | 4    |

| Dislikes | "Feels Off" | Poor Graphics | Simulator Controls too Sensitive | Costly | Difficult Controls | Sim Induced Sickness |
|----------|-------------|---------------|----------------------------------|--------|--------------------|----------------------|
| Count    | 17          | 15            | 8                                | 6      | 4                  | 3                    |

| Suggestions | Improve Graphics | Update Sim Equipment | Improve Control Sensitivity |
|-------------|------------------|----------------------|-----------------------------|
| Count       | 27               | 14                   | 5                           |

# *Thank you for your time*

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