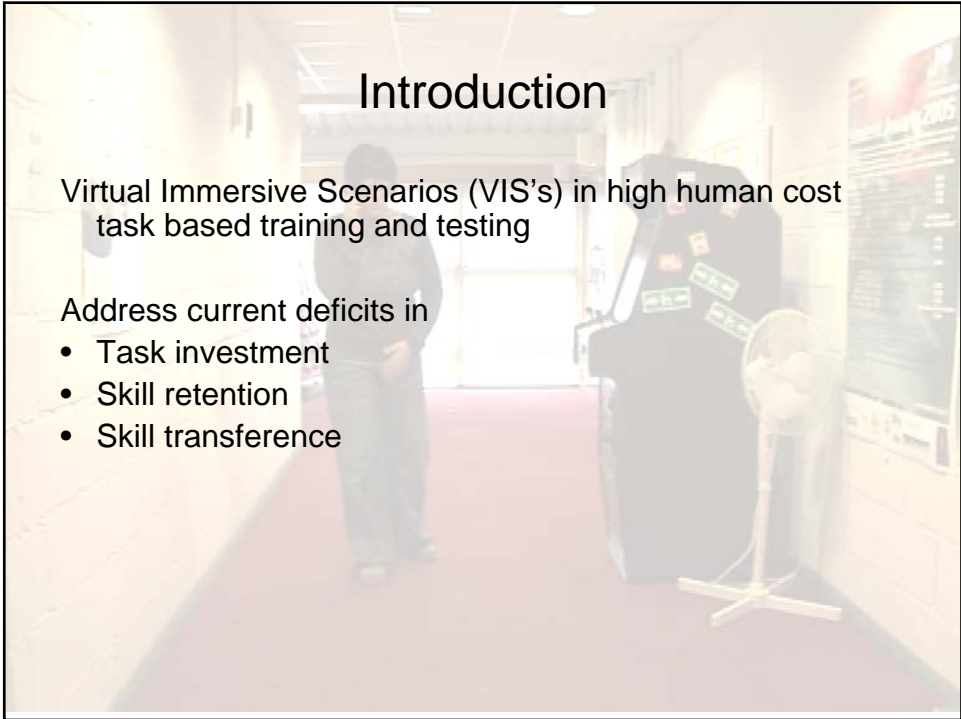


## *The Efficacy of Virtual Immersive Environments in Cardio Pulmonary Resuscitation Training and Testing. Measuring Reality – Is Seeing Believing?*

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## Introduction

Virtual Immersive Scenarios (VIS's) in high human cost task based training and testing

Address current deficits in

- Task investment
- Skill retention
- Skill transference

## Overview

- Validating the efficacy of Virtual Immersive Scenarios (VIS's) as an effective didactic platform presents the dichotomy of *objective* quantifiable task performance versus *subjective* participant evaluation
- How can VIS's be validated as demonstrably fitting their context of use; ergo the **fit** in a comprehensible, comprehensive and credible manner

## The VIS

A combination of

- 3D stereoscopic ecological video footage
- 5 X 2.5 m back projected screen
- Surround sound audio
- Vertalis software
- A Laerdal resuscitation manikin with performance software

## Experiment Design and Protocol

### Stage I

| Independent Variable | <i>n1</i><br><i>Control Group</i> | <i>n2</i> | <i>n3</i> | <i>n4</i> |
|----------------------|-----------------------------------|-----------|-----------|-----------|
| Training             | Non VIS                           | VIS       | VIS       | Non VIS   |
| Testing              | Non VIS                           | Non VIS   | VIS       | VIS       |

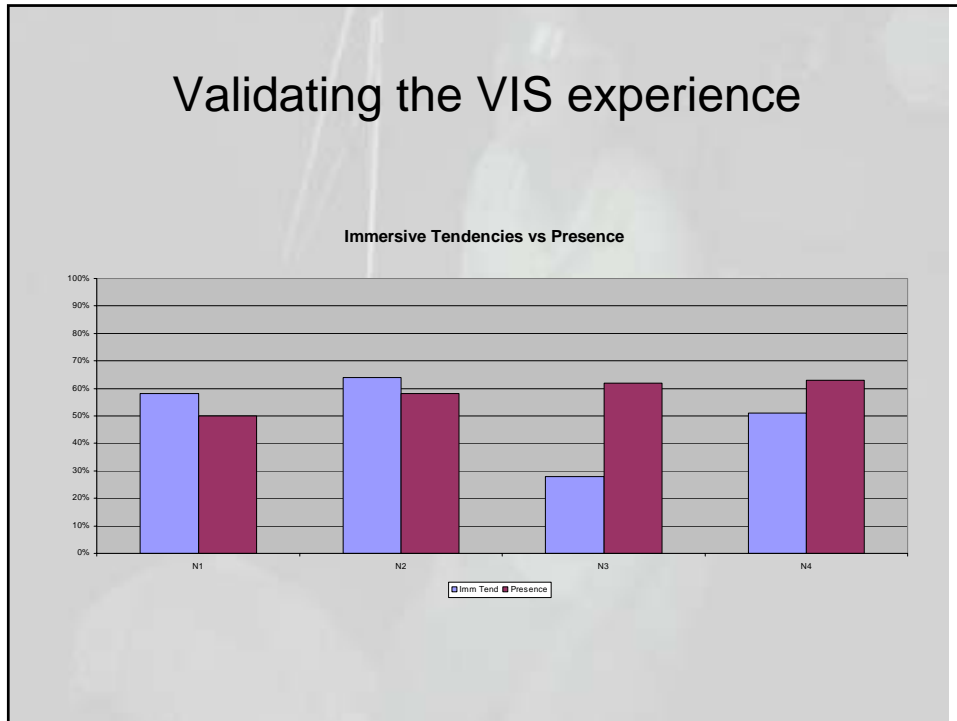
### Stage II

| Independent Variable | <i>n1</i><br><i>Control Group</i> | <i>n2</i> | <i>n3</i> | <i>n4</i> |
|----------------------|-----------------------------------|-----------|-----------|-----------|
| Testing              | Non VIS                           | Non VIS   | VIS       | VIS       |

## Data Collection

| Data Collection  | Pre Train | Post Train | Pre Test | Post Test | During Study |
|--|-----------|------------|----------|-----------|--------------|
| Immersive Tendencies Questionnaire   | X         |            |          |           |              |
| Visual Analog Scale – Confidence, Ability, Preparedness and Knowledge to perform CPR | X         |            | X        |           |              |
| Basic Physiological Readings   | X         | X          | X        | X         |              |
| Manikin Resuscitation Data   |           |            |          |           | X            |
| Video Footage recording participant behaviour  |           |            |          |           | X            |
| Presence Questionnaire   |           |            |          | X         |              |

## Validating the VIS experience



**Visual Analog Scale** – Knowledge, Ability, Preparedness, Confidence to perform CPR. Whilst all groups recorded an increase in their subjective analysis of their projected performance from stage I to stage II Group **N4** showed a significantly higher increase

**Basic Physiological Readings** – Whilst no statistically significant correlation could be found between conditions group **N2** recorded a drop in heart rate pre stage I testing



## CPR Performance

### Stage I

Ventilations - Tentative inference that conditions N3 and **N4** show significantly better performance over conditions N1 and N2

Compressions – Condition **N2** performed significantly better than groups N3 and N4 but not N1

### Stage II

Ventilations - Tentative inference that conditions N2 and **N4** show significantly better performance over conditions N1 and N3

Compressions – Condition **N2** performed significantly better than groups N1, N3 and N4



## Conclusion

The conditions that combine VIS's and Non VIS's (N2, N4) over training and testing show a tentative but positive trend in terms of performance of CPR and retaining skill over a short period

Measuring the efficacy of a VIS and the degree of task investment can perhaps be best evaluated by the video footage of participant performance

## Is Seeing Believing?



## Validation and Evaluation of VIS's

The questions

Are we choosing the right measures?

Should we be creating measures that fit context of use and not generic measures often based on technologies that are a decade old?

Thank you for your time

Any questions?

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