Developing Intercultural Leadership Competency through Virtual Reality:
Design, Innovation & Transdisciplinarity

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PURDUE POLYTECHNIC

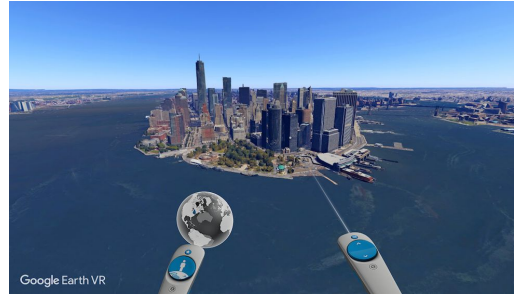CENTER FOR INTERCULTURAL LEARNING
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IMMERSIVE TECHNOLOGIES

Google VR
- Card Board
- Earth VR
- Tilt Brush
- Daydream
- Expeditions
- Jump

IMMERSIVE TECHNOLOGIES

INDUSTRY APPLICATIONS—CONT.

Facebook
- Spaces

PayPal
- Augmented Reality View of Product Instructions

IMMERSIVE TECHNOLOGIES

INDUSTRY APPLICATIONS—CONT.

- Amazon Lumberyard

- Netflix VR

IMMERSIVE LEARNING TECHNOLOGIES

BENEFITS

- Technology variations:
  - Virtual Reality; Mixed Reality; Augmented Reality
- Immersive learning stimulates active, experiential learning
  - Longer retention and faster recall than passive information transference
  - Experiences that are difficult or impossible for formal
    education to provide otherwise make good candidates for VR
  interventions

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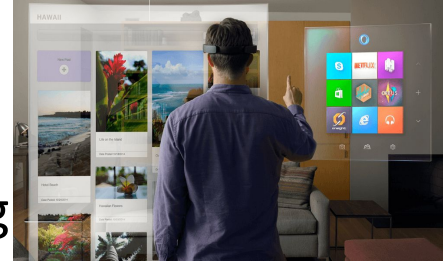
IMMERSIVE LEARNING TECHNOLOGIES

BENEFITS

- Telehora: experiencing something from a distance (television: seeing something from a distance)

- Ability to interact and communicate between physical and simulated worlds, enhancing and stimulating learning:
    - Safe; Scalable; Cost-effective

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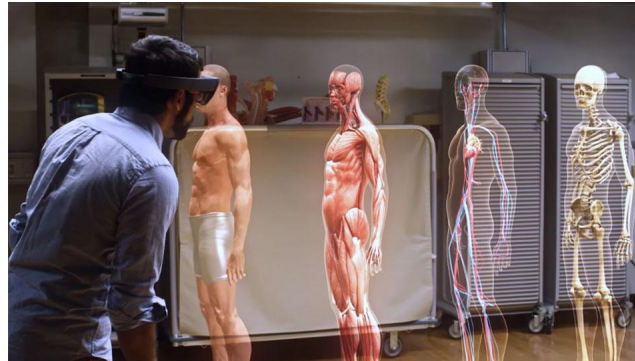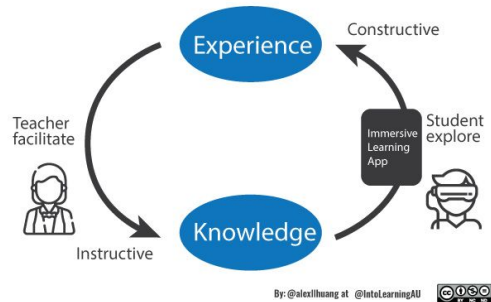
MIXED REALITY DEMO WITH MICROSOFT HOLOLENSE

Envisioning the Future with Windows Mixed Reality

VR for Intercultural Leadership
Innovations under way at Purdue University

INTRODUCTION

INTERCULTURAL LEADERS ARE NEEDED

- College graduates are deficient in soft skills
- Intercultural leadership is vital in contemporary organizations
- Immersive technologies have not been widely used for soft skill development
- Immersive technologies represents a way to integrate soft skill development in technical classrooms

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TECHNOLOGICAL BACKGROUND

- Recent developments drastically reduced cost of VR creation & delivery: i.e., Google Cardboard and Omni GoPro video cameras

- 360-degree video versus CGI images in VR

- Measuring emotional response via biological indicators

  - Facial emotion detection

  - Electromyography and Galvanic Skin Response

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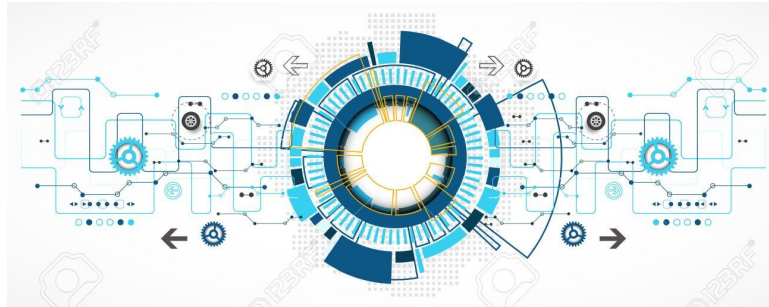
THE RESEARCH STUDY

INTERCULTURAL LEADERSHIP VIRTUAL REALITY SIMULATIONS

Research Question: What is the impact of immersive Virtual Reality as a learning tool for developing intercultural leadership?

On-going Pilot Study

- Recruit up to 200 freshmen from Polytechnic TECH 120--Design Thinking in Technology, a core course required for all majors in the College
- Randomly assign two groups: Experimental (VR-based simulations) and Control (video-based simulations)
- Pre- and posttest design for both groups
- Compare the impact of immersive virtual reality experience through an international business case with video-based simulation
- Gift card for study participants as compensation

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INTERCULTURAL LEADERSHIP VIRTUAL REALITY SIMULATIONS

VR Simulations are designed to emphasize three dimensions of culture:

- Individualism / Collectivism
- Monochronic / Polychronic
- Low / High Power Distance

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THE RESEARCH STUDY

Method: Data Triangulation

➢ *Quantitative*

- Use pre- and posttest include items from: M-GUDS, IDI, authentic leadership, declarative knowledge regarding dimensions of culture, tolerance for ambiguity, Sojourner Self-Efficacy in Communication, lay theory of race, and intercultural sensitivity scale

➢ *Qualitative*

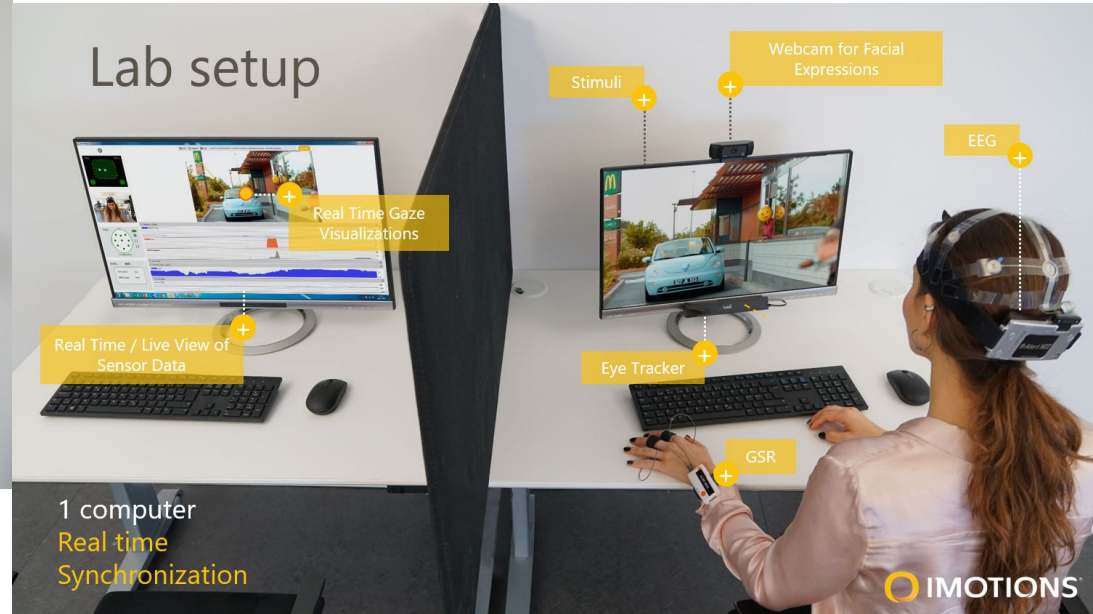- Participant self-reflective responses (debrief format)

THE RESEARCH STUDY

➢ *Biometric Data*: non-invasive biometric measures that indicate the intensity and direction of emotional response

- iMotions to collect participant physiological responses during VR simulations via electromyography and galvanic skin response,

- New insights into student experiences with learning in different interactive environments

- Monitoring real-time emotional response and mental engagement using biological indicators to compensate for the validity concerns of time-delayed and self-report data.

THE RESEARCH STUDY

INTERCULTURAL LEADERSHIP VIRTUAL REALITY SIMULATIONS

Lab setup

Stimuli

Webcam for Facial Expressions

EEG

Real Time Gaze Visualizations

Real Time / Live View of Sensor Data

Eye Tracker

GSR

1 computer
Real time
Synchronization

IMOTIONS

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BIOMETRIC DATA

Galvanic Skin Response (GSR)/Electrodermal Activity

- While we are physiologically or psychologically excited (in fear, extreme joy or under stress), we start to sweat

- Measures physiological responses in the electrical resistance of the skin caused by emotional stress, measurable with a sensitive galvanometer

- With GSR, the impact of **any emotionally arousing** content, product or service can be tested

Electromyography (EMG)

- Measures muscular electrical activity from the surface of the skin
- Common muscles for EMG are the *zygomaticus major* (**smiling**) and the *corrugator supercilii* (**frowning**), although any muscle can be recorded
- EMG can provide information on the **valence** of a stimulus

MONOCHRONIC/POLYCHRONIC

[Intercultural Leadership Virtual Reality Simulation](#)

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DISCUSSION & FURTHER QUESTIONS

➢ What suggestions do you have about the pilot study?

➢ How do you feel about immersive learning technologies in general?

    ➢ Learner experiences

    ➢ Effectiveness for achieving learning outcomes

    ➢ Logistics for implementation

    ➢ Other concerns

➢ What issues should be considered about the use of immersive technologies for soft skill development?

➢ What ideas do you have for intercultural content that might work well for this medium of instruction?

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QUESTIONS & COMMENTS

THANK YOU!

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