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

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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
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
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
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
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
VR Simulations are designed to emphasize three dimensions of culture:

- Individualism / Collectivism
- Monochronic / Polychronic
- Low / High Power Distance
THE RESEARCH STUDY

INTERCULTURAL LEADERSHIP VIRTUAL REALITY SIMULATIONS

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

INTERCULTURAL LEADERSHIP VIRTUAL REALITY SIMULATIONS

➢ **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

1 computer
Real time
Synchronization

Webcam for Facial Expressions
Stimuli
Eye Tracker
EEG
Real Time / Live View of Sensor Data
Real Time Gaze Visualizations

IMOTIONS
Purdue Polytechnic
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 superciliii* (frowning), although any muscle can be recorded
- EMG can provide information on the valence of a stimulus
Intercultural Leadership Virtual Reality Simulation
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?
QUESTIONS & COMMENTS

THANK YOU!

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