What is VR (Virtual Reality)?

• Broad Definition
  “the computer-generated simulation of a three-dimensional image or environment that can be interacted with in a seemingly real or physical way by a person using special electronic equipment, such as a helmet with a screen inside or gloves fitted with sensors.”

• How long has it been around?
  • 1835 – Stereopsis (Charles Wheatstone)
  • 1956 – Sensorama (Morton Heilig)
  • 1960 - Telesphere Mask (Morton Heilig)
  • 1972 - Flight Simulator (General Electric)
  • 1982 – Sayre gloves (Sandin and Defanti)
  • 1989 – VEIW Project (NASA)
  • 1995 - Virtual Boy (Nintendo)
  • 2012 – Oculus Rift (Luckey)
  • 2014- Oculus (Facebook)
  • 2024- Hundreds of companies make VR experiences

History of Virtual Reality
How it works

What Is Virtual Reality And How Does It Work
# Tethered Vs Stand Alone

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<tr>
<th>Metric</th>
<th>Tethered</th>
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*Streaming – Both types can but Tethered is preferred for a list for reasons.*

**Cost** - 300-800$ VS 400-4,000$
HTC – Tethered
• Focused on power

Meta – Stand Alone
• Focused on Portability
  • Accessibility

Apple – Augmented Reality
• Mixed reality experience
  • Content generation

Meta Quest Vs Apple Vision (side by side)
What about Education?

- How is it being used?
  - Virtual Field Trips
  - Immersive Simulations
    - Language and cultural immersion
  - Interactive Learning Modules
  - Virtual Labs

- Where is it being used?
  - Elementary school – Calero et. al
  - Middle school – Zavala et.al.
  - Highschool – Thompson et.al
  - College – Marks et.al
  - Health Sciences (Nursing)– Qin-Chen et. al

- Online Classrooms

- Virtual Learning Environments
VR Classrooms

Benefits

- Equity with Technology
- Special education
- Accessibility
- Safety
- Personalized Education
- Experiential Learning
- Inclusive Teaching
- Cultural and Global Connection/Awareness

Putting the “virtual” in virtual learning
Methods:
• Simulated labs

Common outcomes: 4 metanalyses (Nursing, Medicine, Social Work, Dentistry)
• Improved knowledge and perceived self-confidence
• No difference in skills

CDC VR lab training
VR Test Drive
Future of VR

• Multi-Sensory VR
  • Smell
  • Taste
  • Touch
  • Motion - Treadmill

• Evolving/Dynamic VR Experiences
  • AI Generated/Supervised
  • Oxford Medical Simulation
University Resources

Faculty Center for Teaching and Learning
• Meta Quest 2 Virtual Reality Headsets

Health Sciences and Human Services Library
• HTC Vive in the Innovation Space
References

Effectiveness of Virtual Reality in Nursing Education: Meta-Analysis

Effectiveness of Virtual Reality and Interactive Simulators on Dental Education Outcomes: Systematic Review

Effects of Medical Education Program Using Virtual Reality: A Systematic Review and Meta-Analysis

A Systematic Review and Meta-Analysis of Simulated Learning’s Effects in Social Work Education
Questions?