

Advancing Education with Technology

Exploring Virtual Reality and Online Classrooms



Scott Riley II



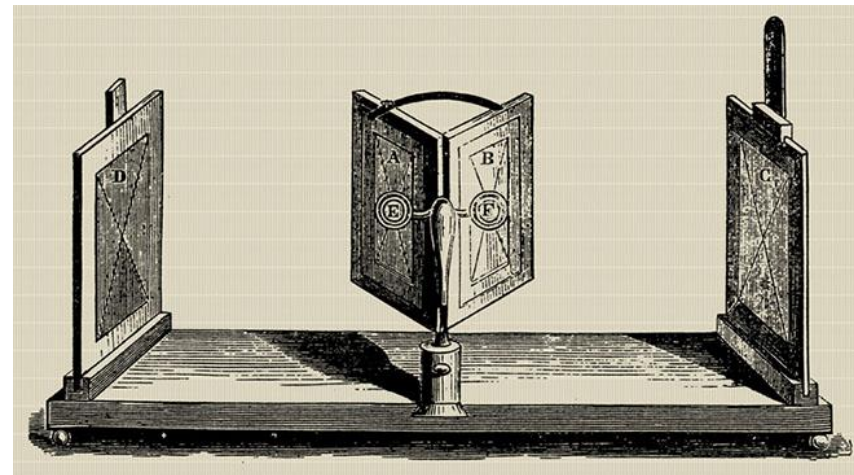
What is VR (Virtual Reality) ?

- **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?**

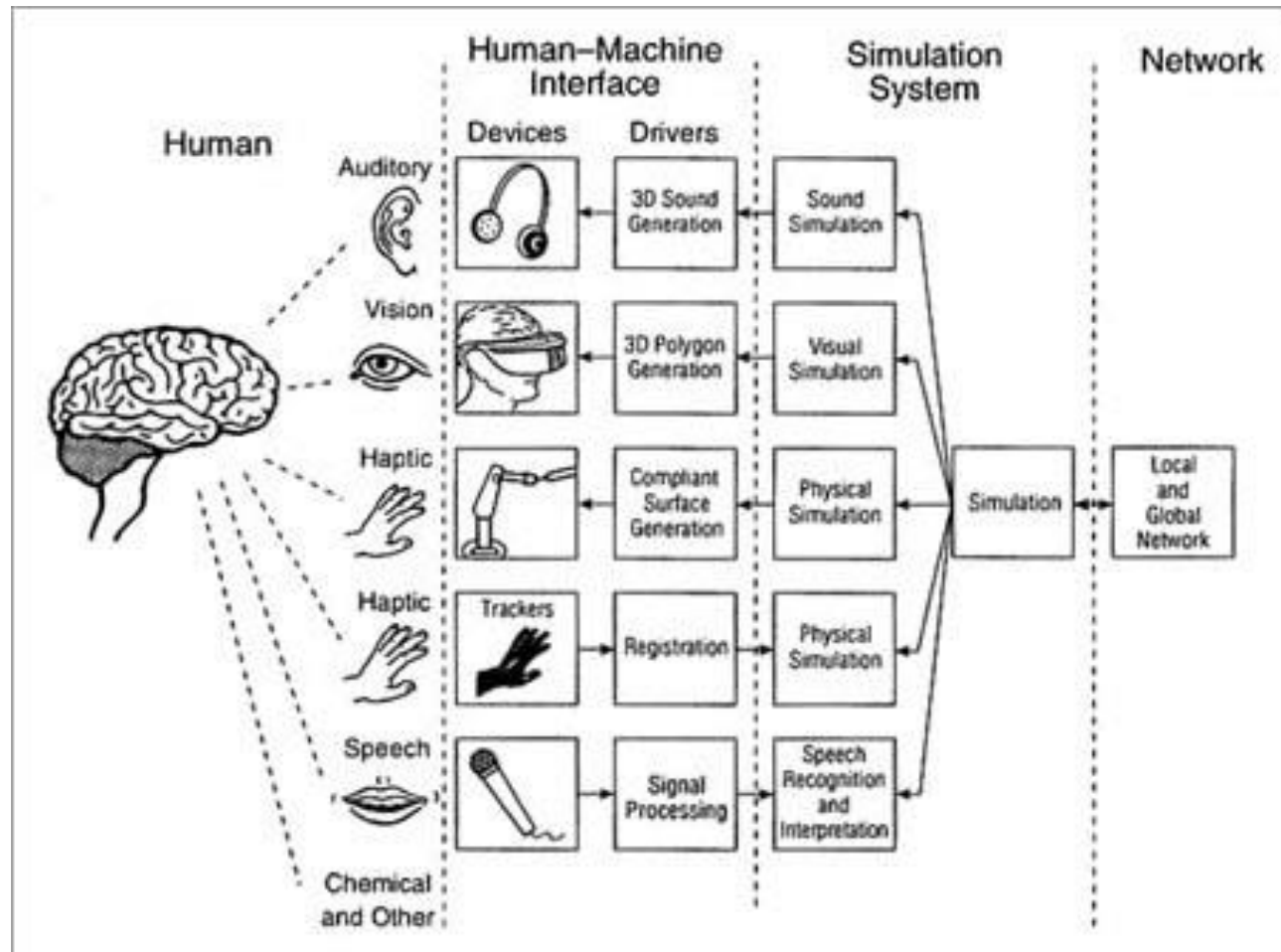
- 1835 – Stereopsis (Charles Wheatstone)
- 1956 – Sensorama (Morton Heilig)
- 1960 - Telesphere Mask (Morton Heilig)
- 1972 - Flight Simulator (General Eelectric)
- 1982 – Sayre gloves (Sandin and Defanti)
- 1989 – VEIW Project (NASA)
- 1995 - Virtual Boy (Nintendo)
- 2012 – Oculus Rift (Luckey)
- 2014-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



[The Wheatstone mirror stereoscope](#)



How it works





Tethered Vs Stand Alone

Metric	Tethered	Stand Alone
Content	✓	✗
Graphics	✓	✗
Tracking	✓	✗
Portability	✗	✓
Battery	✗	✓
Content	✓	✓



[Stand Alone – Oculus Quest 2](#)



[HTC Vive Pro 2](#)

Streaming – Both types can but Tethered is preferred for a list for reasons.

Cost - 300-800\$ VS 400-4,000\$



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VR Landscape

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](#)



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VLE - Labs



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](#)



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VR Test Drive





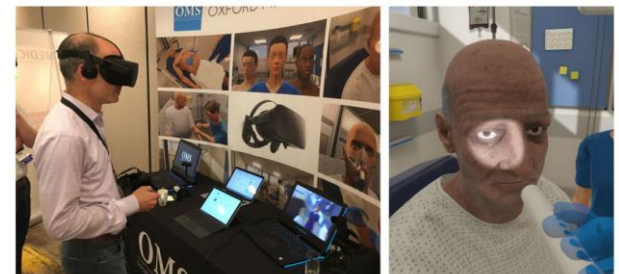
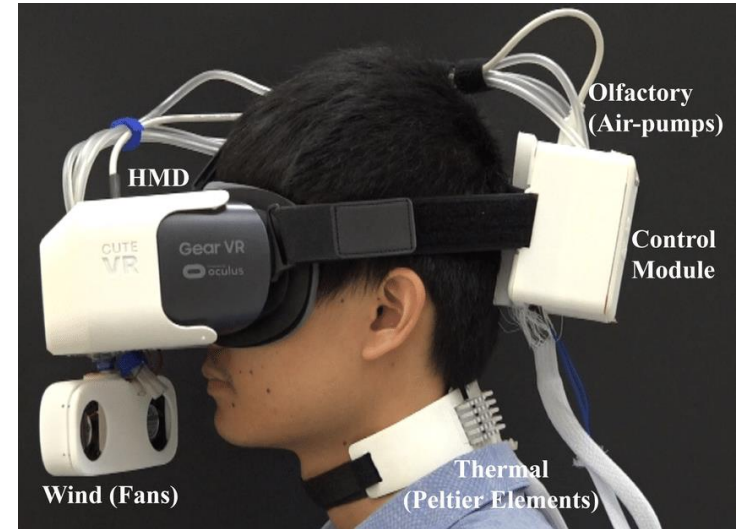
Future of VR

- **Multi- Sensory VR**

- Smell
- Taste
- Touch
- Motion - Treadmill

- **Evolving/Dynamic VR Experiences**

- AI Generated/Supervised
 - [Oxford Medical Simulation](#)





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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](#)





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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](#)



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Questions?