Virtual Reality (VR) Technology use in General Practice Training

BY DR YASAR KHAN
Objectives

Define
Define Virtual Reality

Discuss
Discuss the use of Virtual Reality Technology as a learning tool in Healthcare

Evaluate
Evaluate the use of Virtual Reality Technology as a learning tool in the Management of Medical Emergencies presenting to General Practice
VR Video

https://www.youtube.com/watch?v=8F_PeHVSVC0

How would you Define VR?
What is Virtual Reality?

- Form of Simulation
- Simulation can be defined as:

  “Devices, trained persons, lifelike virtual environments, contrived social situations that mimic problems, events or conditions that arise in professional encounters” (Issenberg et al., 2005).

  “Simulation is a technique – not a technology – to replace or amplify real patient experiences with guided experiences, artificially contrived, that evoke or replicate substantial aspects of the real world in a fully interactive manner” (Gaba, 2004)
Virtual Reality Society (2017) define VR as:

“the term used to describe a three-dimensional, computer generated environment which can be explored and interacted with by a person. That person becomes part of this virtual world or is immersed within this environment and whilst there, is able to manipulate objects or perform a series of actions”
Discuss in Pairs:

In what ways has VR been used in General?

In what ways has VR been used in Healthcare?
VR Current Uses

VR Technology as a learning tool has been used in Safety critical industries (Vozenilek et al, 2004).
VR use in Healthcare Education

- Use in Major Emergency Scenarios; Multiagency response to a major disaster – collaborative working (Cohen et al, 2017)
- Anatomy Teaching (Levinson et al, 2007)
- Surgical Procedures (Kneebone et al, 2003)
- Dermatopathology – virtual slide microscopy (Shahriari et al, 2017)
- Nurse Education - (Sapiano et al, 2018)
SIMUSCAPE - (Thies at al, 2014)
THE SIMUSCAPE

Experiences with a Simulated Learning Environment – The Simuscape: Virtual Environments in Medical Education (Thies et al, 2014):

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td>Medical school of the Westphalien Wilhelms-University in Germany</td>
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<tr>
<td>SimuScape – VR environment</td>
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<tr>
<td>Circular training room – 6 metres in diameter</td>
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<tr>
<td>Generates images and background noise</td>
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<tr>
<td>Students are able to interact with simulated patients in this VR environment</td>
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<td>Multiple scenarios created - CPR, RTA</td>
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<td>Limitations: Cost and Space</td>
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VR use in General Practice

The Responses of GPs vs GP Registrars to unreasonable patient demand for antibiotics (Pan et al, 2015)

- Overall GPs/Trainees found it a useful exercise.
- Limitations: No mechanism for a delayed abx script, delegated response provided to the researcher
Group Work

Discuss in Pairs?

What are you thoughts on the use of VR as a learning tool for GP Training in the Management of Medical Emergencies in General Practice?
Rationale for use in Emergencies

GMC Good Medical Practice (2013):

1. “Patients must be able to trust doctors with their lives and health”

2. “Keep your professional knowledge and skills up to date”

- Industries whereby routine practice could possibly lead to the death of people are termed safety critical industries (Kohn, Corrigan and Donaldson, 2000)

- Simulation as a learning tool in medical education has been shown to enhance patient safety (Issenberg et al, 2005)
Why specifically investigate the Use of VR in General Practice in Acute Emergencies?

- The epidemiology of malpractice claims in primary care: a systematic review (Wallace et al, 2013):
  1. Misdiagnosis or delayed diagnosis of conditions most common cause of litigation.
  2. Conditions: Meningitis and Cancer Cited

- Lack of reporting of patient safety incidences into the NPSA – approx 1% of all nationally reported incidents arising from General Practice (Milligan et al, 2015)

- Children with Meningitis presented earlier to General Practice than in secondary care - often with undifferentiated symptoms compared to the classical presentation (Haj-Hassan et al, 2011)
  - Most GPs experience of acute emergencies is in secondary care
  - Presentation and management of emergencies in Primary Care is different to that of Secondary care
Model of Illness (Silverstone, 2012)
Why VR?

- Ability to create a 3D virtual environment that allows interaction → Reflection in action and on Action (Schon, 1983).

- Create novel scenarios difficult to re-create by other means → specific to the General Practice environment with appreciation for the challenges of working in General Practice → Experiential Learning (Kolb, 1984).

- Pedagogical shift – Apprentice model → Simulation based learning
  - See One, Do One, Teach One → See one, Practice Many, Do One
Bradley (2006)
## Research Project - Virtual Reality technology use in GP (Khan, 2018) - Preliminary Findings

- Awareness of VR Technology Exists
- Various scenarios for VR use in the Emergency Situation
- Non Emergency Use – Practical Procedures within General Practice
- Patient Education
- Independent Learning with Support
- Technological Age → Gaming/Entertainment → Learning
- Cost/Finance
- Technical Support → Need for Training
- Augmenting other learning Strategies
Technology Acceptance Model (Davis, 1989)
Gamification

“Use of game design elements in non-game contexts” (Deterding et al, 2011).

- Growing interest in Higher Education
- Lack of good quality long term studies demonstrating impact
- Research evidence has not kept up with Practice
Simulation/Simulacrum

A false sense of reality \(\rightarrow\) Self-Referential Reality

Simulation of learning rather than learning from Simulation
(Bligh and Bleakley, 2006)

Engage in the simulated activity rather than use the learning to change real clinical practice.
## Objectives

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Final Thought

“No industry in which human lives depend on the skilled performance or responsible operators has waited for unequivocal proof of the benefits of simulation before embracing it. In my opinion neither should anesthesia” (Gaba 1992)

Nor should General Practice