WHAT CAN MEDICAL STUDENTS LEARN IN A VIRTUAL HOSPITAL?

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RESEARCHING VIRTUAL WORLDS

References: Blyth & Loke, 2014; Chee, Loke, & Tan, 2009; Loke et al., 2011
OUTLINE

1. Role playing as a learning strategy
2. Otago Virtual Hospital (demo)
3. What can medical students learn?
   ▶ Supplement or Replace residentialss?
4. Challenges encountered
5. Discussion & Questions
WHY ROLE PLAY TO LEARN?

Role plays feature realistic scenarios in make-believe contexts as basis of learning & assessment

1. From Passive observation to Active participation
   ▶ Redress typical imbalance between propositional vs functional knowledge, between knowing vs doing
2. Make-believe > Safe

References: Biggs & Tang, 2003; Butler, 2012; Dewey, 1938; Naidu, 2007; Spencer, 2003
WHY IN A VIRTUAL WORLD? (vs physical world)

1. Clinical teaching (PW) opportunistic; VW role plays more systematic (e.g. control types of scenario)

2. Realistic enough for experiential learning of clinical practice
   - And other practices: teacher education, social work, foreign languages

2. Logistical reasons (e.g. scalability)

References: Boulos et al., 2007; Hansen, 2008; Dalgarno & Lee, 2010; Spencer, 2003
OTAGO VIRTUAL HOSPITAL

- Medical students role play as junior doctors in Emergency Department
- Students can: communicate with patients & fellow doctors, perform ‘physical’ examinations, order tests, prescribe medicines, write handover notes
OTAGO VIRTUAL HOSPITAL (DEMO)
# Emergency Department Triage Record

Name: Gertrude Anne MacFarlane

Date of Birth: 16 July 1936

Age: 75

Health Number: RXYM802

GP: Andrews

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**Contact Person**

Name: Angela Donaldson

Phone: ?

Relationship: Daug

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**Presenting Complaint:**

Feels unwell

Neighbour reports some confusion - new

Feels hot T°C up

No sputum, no falls

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**Vital Signs in Triage:**

- Pulse: 130 ir
- Blood Pressure: 122/68
- Temperature ºC: 37.9
- Respiratory rate: 28
- SpO₂: 92 RA

**Allergies:**

Nil known
PHASES OF ROLE PLAY

1. **History-taking**
2. ‘Physical’ examination
3. Order tests
4. Prescribe medicines
5. Negotiate treatment plan
6. Write handover notes
ORDERING TESTS

Which type of Radiology examination would you like to request?

Note:
Selecting CANCEL will abandon a request, selecting RESET will restart a request.

- X-RAY
- CT
- MRI
- CANCEL

- View Radiology Results
- View Non-Blood Results
- View Haematology Results
- View Biochemistry Results
- View Medications Chart
- Stop Current Medication
- View Fluids/Blood Order Chart
- View Diagnostics Chart
REFLECTION & PEER FEEDBACK

Notecard: Sc1 Log 21 Apr 12:19

Description: Script generated notecard

- 12:03: sweekin loke: Initiated scenario.
- 12:04: sweekin loke: Moved ECG machine to cubicle.
- 12:05: sweekin loke: Moved IV Unit to cubicle.
- 12:11: sweekin loke: Ordered X-RAY, CHEST
- 12:15: sweekin loke: Viewed radiology results.

How well did your House Surgeon interact with you on the following items? *

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<th></th>
<th>None</th>
<th>Some</th>
<th>OK</th>
<th>Good</th>
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<td>Friendliness/Rapport</td>
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<td>Introductions</td>
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<td>Providing information</td>
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WHAT CAN STUDENTS LEARN IN THE OVH?

How might OVH supplement or replace residentialis?
STUDENTS EXERCISE PW CLINICAL REASONING

- Evaluate validity of OVH-based assessment of clinical reasoning
- 12 participants (different stages of medical training)
- More medical experience > significantly better performance in terms of clinical reasoning:
  - Transformed info into key clinical concepts more efficiently
  - Generated more accurate diagnoses in a timely manner
- Construct validity supported: students exercise PW clinical reasoning in VW

STUDENTS GET TO “DO THE THINGS”

- 11 medical students participated in Scenario 1
- “What role can this virtual hospital play in your medical education?”

- “Well, you actually do the things here. Whereas in the SECO clinic, you write down or think about what you’re going to do, but you don’t go and do them.”

- (clinical placements) “I certainly wouldn’t be the one making the call. I wouldn’t want to be the one making the call.”

Reference: Loke, Blyth, & Swan, 2012
WHAT STUDENTS CANNOT LEARN
WHAT STUDENTS CANNOT LEARN

- Learn X by doing X: Does doing $X^{vw}$ correspond to $X^{pw}$?
- “you actually do the things”: But not physical aspect of actions
  - $X^{vw} = \text{click on “Intubate” button}$
  - $X^{pw} = \text{inserting laryngoscope to displace tongue to one side}$

- Bonedoc closer to imitating physical movements
WHAT STUDENTS CAN LEARN

- Students can learn clinical reasoning:
  - Clinical reasoning (VW) corresponds to Clinical reasoning (PW)

- “you actually do the things here”:

- Students cannot learn physical aspects of intubating patients

- Student can learn dispositional aspects:
  - When to intubate patient, when to “make the call” (to examine chest, to discharge patient, etc.)

References: Loke, 2015; Loke & Golding, 2016; Perkins et al., 2000
SUPPLEMENT OR REPLACE RESIDENTIALS?

- Do learning objectives require students’ physical bodily experience?

- Parallel: flight simulators most effective when used in conjunction with actual experience of flying

References: Dreyfus, 2001; Hays et al., 1992
CHALLENGES ENCOUNTERED

1. Integration into curriculum
2. Scalability
CHALLENGE #1: INTEGRATION INTO CURRICULUM

- Find space in existing curriculum
  - Could not free up one hour for all students to role play
- Or create new space
  - new Critical Care module for Year 6 Trainee Interns in 2016
CHALLENGE #2: SCALABILITY

- Experiential learning involves iterative cycles of practice-reflection
- Previous models limited student participation: e.g. single hospital; dependence on instructor input

Solution: Peer feedback; the Holodeck

References: Blyth & Loke, 2014; Honey et al., 2012
DISCUSSION & QUESTIONS
THANK YOU

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