Content

The Centre for Innovation

People first in a digital age.

Mission
To identify and explore transformative trends in a digital world, creating innovative methods, products and solutions for Leiden University and its partners


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AR & VR at C4I

2015 - 2017	several 360 Videos - Leiden / Archaeology/ Kidney Transplant : exploring production of 360 video
2016 - 2017	360VR app - Red Cross : exploring app building
2017 - 2018	360VR app - Pilot Virtual ward. Exploring technical and interactive possibilities
2016 - 2019	AR Hololens app - Dynamic Anatomy 'Ankle app', together with Leiden University Medical Centre
2017 - 2019	360VR University wide Pilot: Developed 6 different apps with different faculties
2019	360 VR - Acute Medicine - Time for Action AR Hololens Lung App & Kidney App, together with Leiden University Medical Centre

Virtual Ward and Kidney transplant.

360 video based
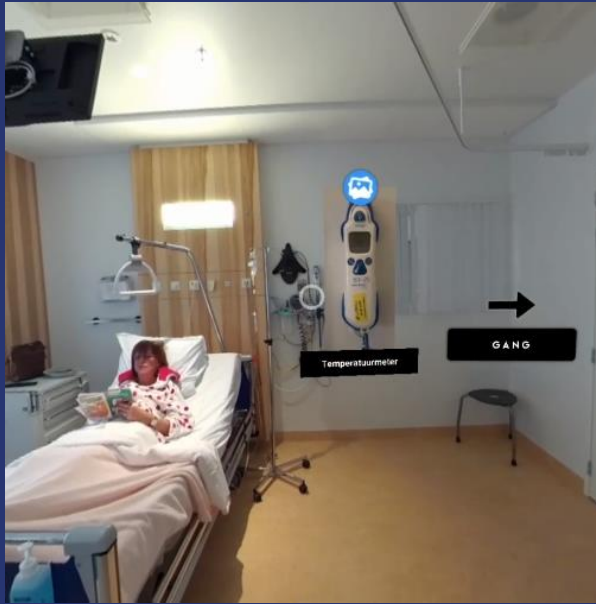
360 VR Pilot: 6 apps with faculties

Archeological field tech.

Lab Safety

Athropology - Mine Ghana

Remote Sensing

The Classroom Experience

Dementia Experience

Lessons learned - technical

- Still cutting edge technology teething problems
- Big influence of 'small issues': flickering, pivoting chairs
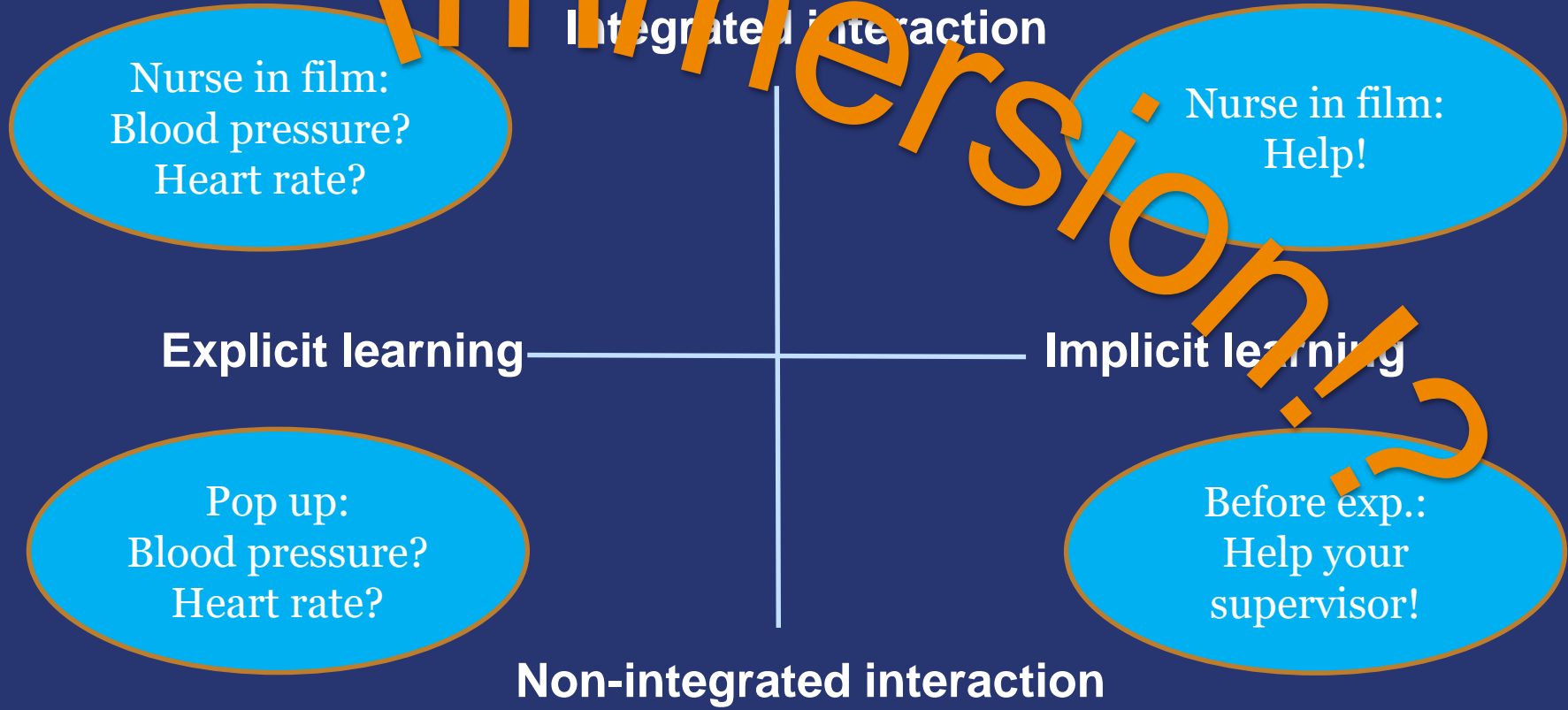- Teach the teachers (e.g. how to use and update the Oculus)

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Lessons learned - educational

- Immersion

Lessons learned - educational

- Immersion
- Added value: repetition, discussion
- New stuff, most students like it, thus are not objective
- Long term effectiveness of lessons not known yet (CFI is looking for Master / PHD students)
- The moment students put on the Oculus, they loose contact with the teacher and each other

Lessons learned - process

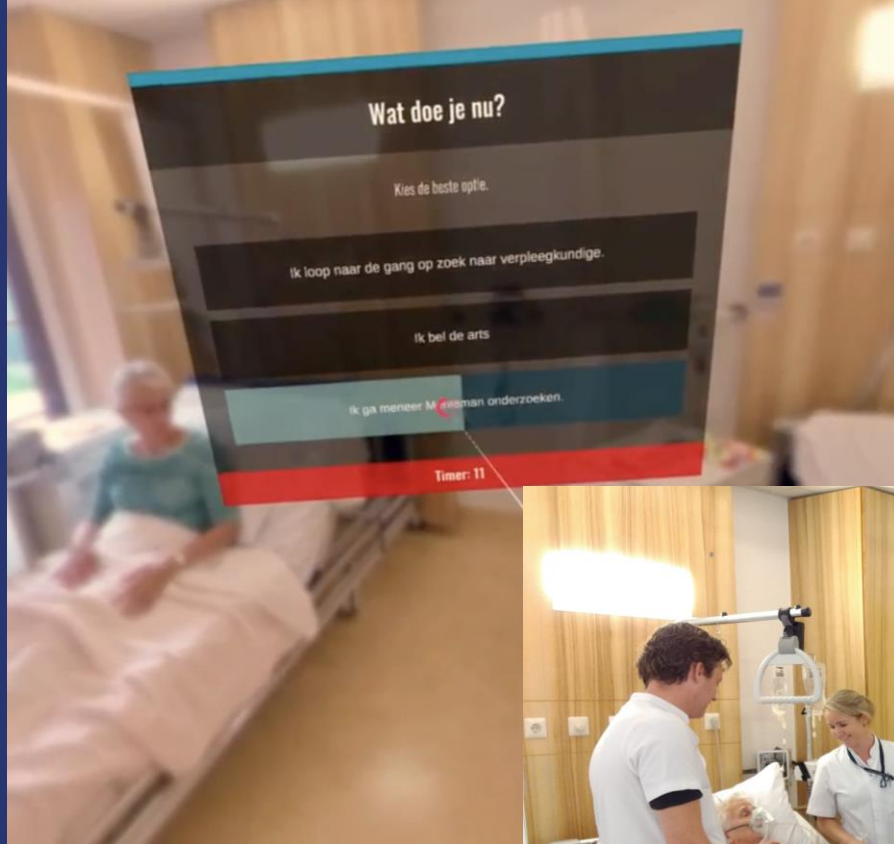- Never do 6 parallel pilots in such a small team...
- Define the result / end product as exactly as possible
- Keep an eye on the possibilties of using the results wider than the pilot
- Asses the character and availability of your partner(s) / product owner(s) in the faculties
- Do not make things too complicated

It's only a pilot, buddy!

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Emergency Care – Time to Act

*Practicing protocol based
decision making*

Wat doe je nu?

Kies de beste optie.

Ik loop naar de gang op zoek naar verpleegkundige.

Ik bel de arts

Ik ga meneer Middleman onderzoeken.

Timer: 11

Context

Applying the ABCDE protocol during life threatening situations

- Doctor + intern

ABCDE Assessment

	Initial assessment (look, listen, feel)	Measure	Action	Consider (after initial assessment)	
A Airway	**Is the airway patent - can the patient talk?** Snoring, stridor, obstruction (e.g. foreign body, vomit, blood, edema) Cervical spine		**Non-patent airway:** - Head tilt, chin lift, jaw thrust - Suction - Naso/oropharyngeal airway **O^2 (15 L/min)**		Assess, Treat as you go and Re-assess
B Breathing	Cyanosis, use of accessory muscles, breathing depth and rhythm, tracheal position, symmetrical chest expansion Breath sounds and auscultation Chest percussion	Respiratory rate SpO^2	Positioning of patient Bag/pocket mask ventilation Decompression of pneumothorax Inhalations	ABG Chest X-ray	
C Circulation	Bleeding Skin: - Color (pale, red, mottled) - Cool/warm/dry/sweaty Auscultation	Capillary refill time Pulse Blood pressure ECG	Stop bleeding IV/IO access Fluids/blood	12-lead ECG Blood tests Urinary catheter ECHO/FAST/FATE	
D Disability	AVPU Pupils (reaction, size, equal) Neck stiffness	GCS Blood glucose	Recovery position	Lumbar puncture Focused neurologic assessment Rectal examination (sphincter tonus)	
E Exposure	**Head-to-toe assessment:** - Trauma, fractures, wounds, lesions - Bleeding - Infection, petechiae, rash	Temperature	Prevent hypo-/hyperthermia Stabilize fracture	Blood cultures Culture from wound Antibiotics	

SATS

Nørgaard S, Hindborg M, Jensen L, Kristensen C
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EMSS17

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The Problem

- **Gap between learned theory and using it in practice.**

- Students feel insecure and avoid practice.
- Training situations not always available.

THEORY ←——————→ PRACTICAL WORK ENVIRONMENT

Goals

- Make students feel more **secure** during actual life-threatening (training) situations.
- Empathizing with their future role: become **aware of difficulty** of application. → study methods.
- Aid decision making for **future paths**: is this a challenge or a nightmare?

Solution

- Simulate a life-threatening situation in a hospital room context the user is familiar with:
    - Doctor – intern
    - Visitation round
- Provide users an interactive model reflecting application of ABCDE protocol.

Inspiration:
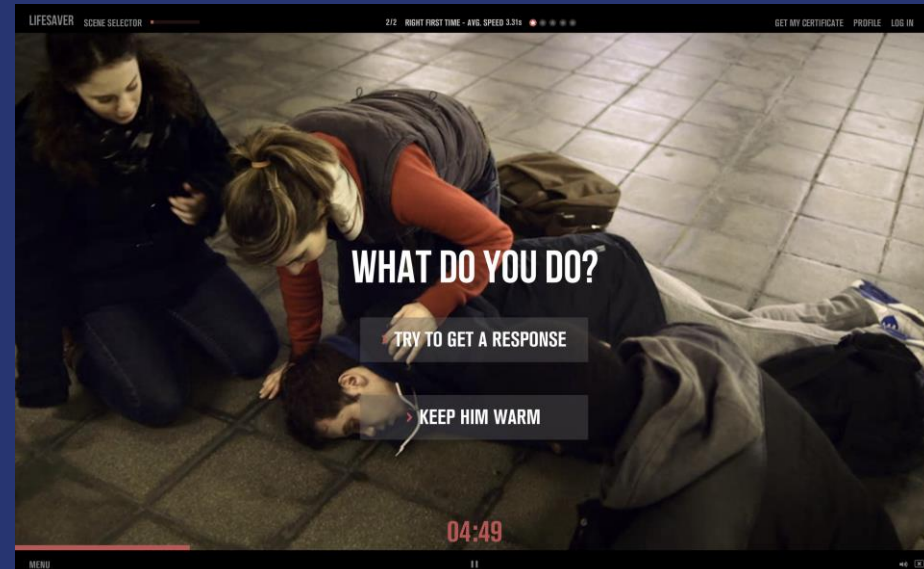
The Process

Case, content and story design:

- LUMC specialized doctor
- C4I
  - Learning Experience Design
  - UX
  - Director

Video:

- Production (actors!)
- Direction, Filming and editing

UX Design

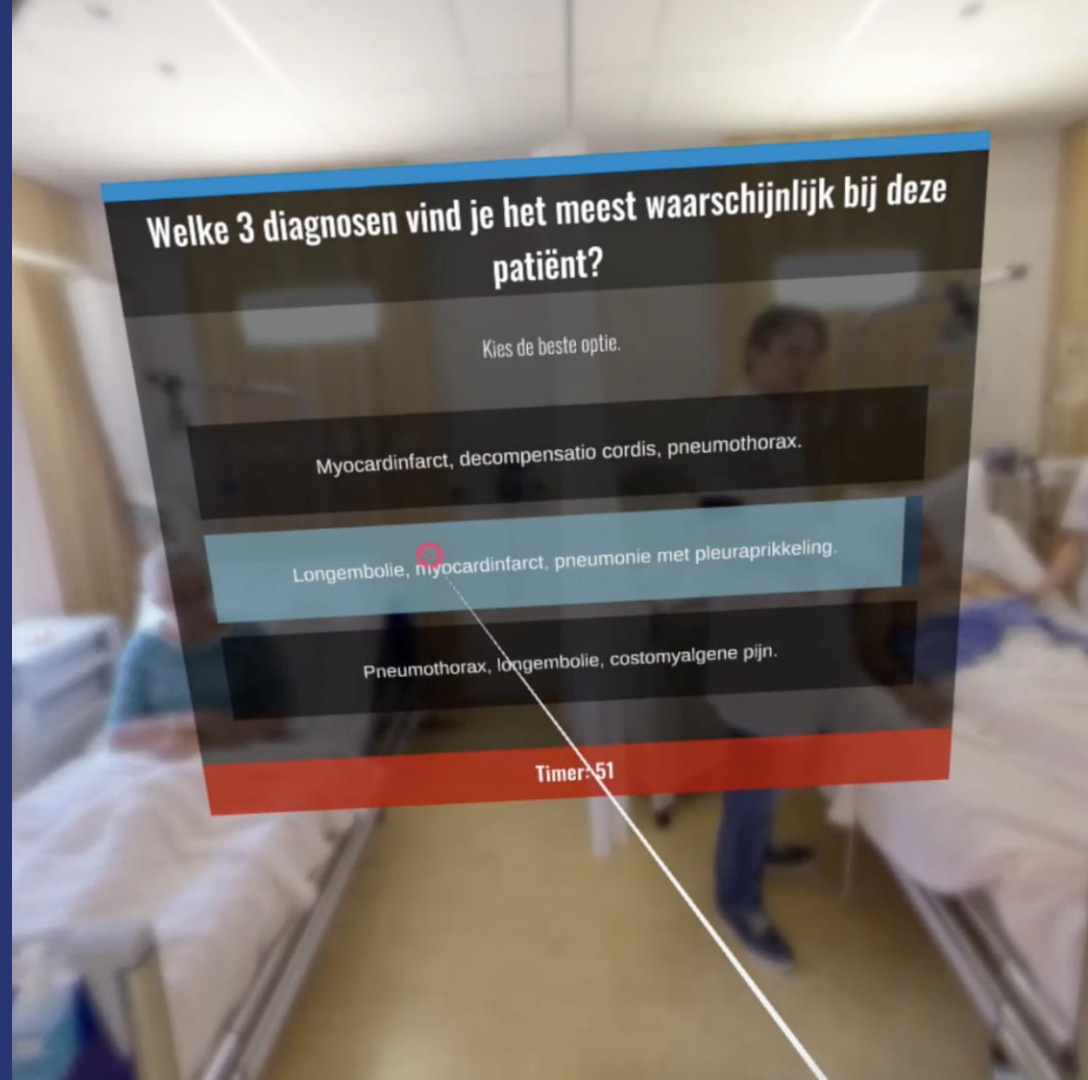- Testing question understandability
- Question interaction

Development: from video to interactive experience

- Unity as game engine
- Oculus Go as display

Testing with actual users

Solution

- Proven case
  - Condition
  - E.g. Switch or not
- Induce stress
  - Focus on decision making
  - Temporal aspect

Welke 3 diagnosen vind je het meest waarschijnlijk bij deze patiënt?

Kies de beste optie.

Myocardinfarct, decompensatio cordis, pneumothorax.

Longembolie, myocardinfarct, pneumonie met pleuraprikkeling.

Pneumothorax, longembolie, costomyalgene pijn.

Timer: 51

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Results

- Implementation just started
- Very positive response so far

Time for a demo?

Lung Cases

Dynamic Anatomy

https://www.youtube.com/watch?v=QSTiFBW_GhQ

Coming up:
Viewing Kidney CT Scan

Let's build a
HUB!

**Sharing VR and AR apps for
education and research
Sharing knowledge on building
and implementing apps.**

An initiative of:

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Questions and Answers

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