Innovations in simulated learning environments: using all the senses

RCN Education Conference Harrogate
Feb 26th - 27th 2014

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Simulation and the senses

• Using the senses as part of active learning for health professionals includes the need for seeing, noticing and observing (Dewing 2010); however other senses may be equally important.

• Less is known about the impact of other senses
Immersive learning & the senses

• Previous work in disaster management has explored immersive training as a tool to help prepare trainees to cope with the disturbing sights, sounds, and smells they might experience once deployed, as well as sustain resiliency, and increase their ability to perform their jobs effectively (Klomp, Spitalnick and Reissman 2010).

• Training aimed to enhance the competence and confidence of members of emergency disaster teams prior to deployment by providing a safe and supportive opportunity to practice adjusting to unfamiliar and potentially challenging stimuli.

• Similarly, refer to experiential learning perspectives and in particular situated cognition as a pedagogical framework; whereby learning takes place through social activity incorporating the mind, the body, the activity and the tools in a complex and interactive environment (Paige and Daley 2009).
Memories associated with smell are often very vivid, having the effect of taking an individual back in time (Willander and Larsson 2006).
An inquest into the death of Gillian Astbury found that there was a failure of nurses to administer insulin when Ms Astbury developed ketoacidosis, (The Guardian 2013).

It is well known that one of the most notable symptoms of ketoacidosis is the smell of ketones on the breath (Peate, Nair, Hemming and Wild 2012) often described as being like pear drops, fruity, alcohol-like or acetone.
Whilst nurses might consider the patient’s wishes about the selection of particular wound dressing; much less is known about the psychological impact of living with a malodorous wound.

Furthermore, nurses might tend to assume that patients have somehow become accustomed or sensitised to the smell and therefore may not broach the subject with the patient (Goode 2004).

Few studies have investigated how nurses have dealt with malodorous wounds, more research is needed which focuses on the psychological aspects of care.
Using Smell within Immersive Learning

- In terms of simulated learning, the fidelity or similarity to the real world is important and educators are required to develop authentic replicas of a range of clinical encounters. Fidelity refers to aspects of both the environment and psychological fidelity; in other words, the physical characteristics of the environment and the emotional connection or feelings evoked by the learning stimulus are equally important.

- Research to isolate clinical (and other) odours, and test these within immersive environments.
Enhanced simulations using the immersive dome and the implementation of other types of technology is proposed as a means to encourage a more refined and natural user engagement.

Supported with the presence of sensory interaction that include smells, haptic feedback and natural user control made possible through dynamic software applications and complimentary hardware, our intentions are to more accurately represent realistic environments.
Sounds of clinical practice

Although much has been written about expertise, there is a gap in the literature concerning how nurses learn to use auditory cues, and filter out the ambient noise of the clinical environment in order to focus on what they need to hear. Anecdotally, for example, many students struggle to hear Korotkoff sounds associated with taking blood pressure recordings manually.
Sounds of practice

- Previous work has been undertaken to simulate the auditory hallucinations experienced by people with schizophrenia in order to increase empathy and understanding about the condition giving participants an ‘insider's perspective’ maximising empathy and respect (Ando et al 2011, Chaffin and Adams 2012).

- Used a pre-recorded training CD containing a range of voices, 67 psychiatric nursing students listened to via headphones whilst undertaking a range of simple tasks. The participants are reported as being emotionally changed by the experience and were “more focused and showed extreme kindness and patience when interacting with psychiatric patients” (e10)., on return to clinical practice.

- Therefore, the sounds of clinical practice are associated with bodily cues and those of equipment and the environment itself; but it appears that to date there is minimal work in this field, particularly in terms of learning to recognise such sounds; and whether including such sounds in immersive learning scenarios enhances student learning.
Contemporary technology includes the ability to simulate forces and hence administer sensations which are perceived as touch or force (Hamza-Lup and Stanescu 2010).

When force feedback simulation is combined with visual simulation students are able to have what Reiner (1999) (Cited by Weiber et al 2009) terms as an embodied experience which resulting in the learning developing more accurate mental models and representations said to enhance learning.

The evaluation of technology acceptance and impact on learning are areas requiring further research. For example, it is known that sensory symptoms such as tingling or burning are commonly described by people with Parkinson’s disease (Poewe 2008), such tactile hallucinations are often reported alongside visual hallucinations (Poewe 2008, Holroyd, Currie and Wooten 2001).
Our Plans

• Devising innovative ways to evaluate the effectiveness of introducing sound, smells and haptic feedback as part of immersive learning scenarios; does this lead to deeper learning?

• Is there an impact on learning in clinical practice?

• Empathy?

• Effective if used with patients in symptom recognition and seeking earlier treatment?
References


Hamza-Lup FG., and Stanescu IA. The haptic paradigm in education: Challenges and case studies. Internet and Higher Education. 13: 78-81.


