Augmented Reality-Based Tele-Mentoring - An Innovative Approach for Scenario-Based Training: A protocol

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Background

- Many rural and remote areas in Australia experience challenges around the quantity, skill set, and skill mix of the healthcare workforce. [1]

- Many health services experience difficulties in attracting and supporting a skilled health workforce to work rurally. [2]

- *Tele-mentoring* can potentially offer a solution to maintain the professional skills and retention of isolated rural healthcare workers 'at a distance'. [3]

- *Tele-mentoring* is a method using a technological communication device to provide instruction from an expert to a less-experienced practitioner at a different geographic location in real-time. [3]

- The incorporation of *Augmented Reality* (AR) technology into tele-mentoring systems has been reported internationally.

- *Augmented Reality* is defined as a form of immersive experiences in which the real world is enhanced by computer-generated three-dimensional content, which is overlaid on the real environment. [4]
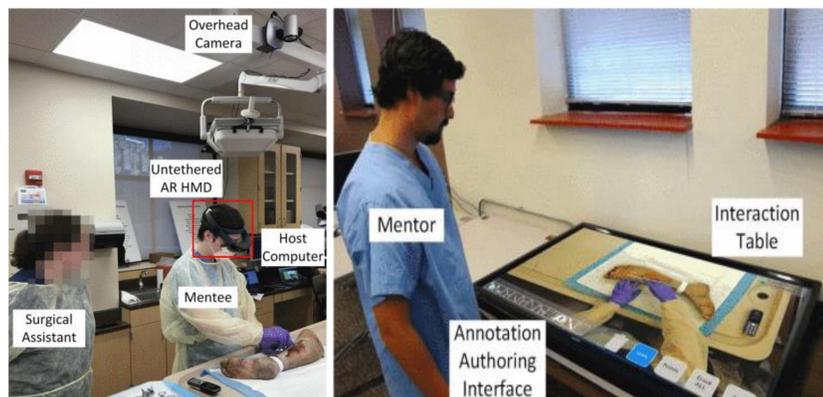

Figure 1: An AR tele-mentoring system based on HoloLens, an AR head-mounted display, at the mentee side (left) and on a full-sized touch based interaction table at the mentor side (right). [5]

Figure 2: The virtual incision line and instruments are only seen by the participant, and they were added here for illustration purposes. [5]

- However, we do not know the true value and usefulness of AR in mentoring clinical health care professionals remotely.

Interaction mechanism of an AR tele-mentoring system
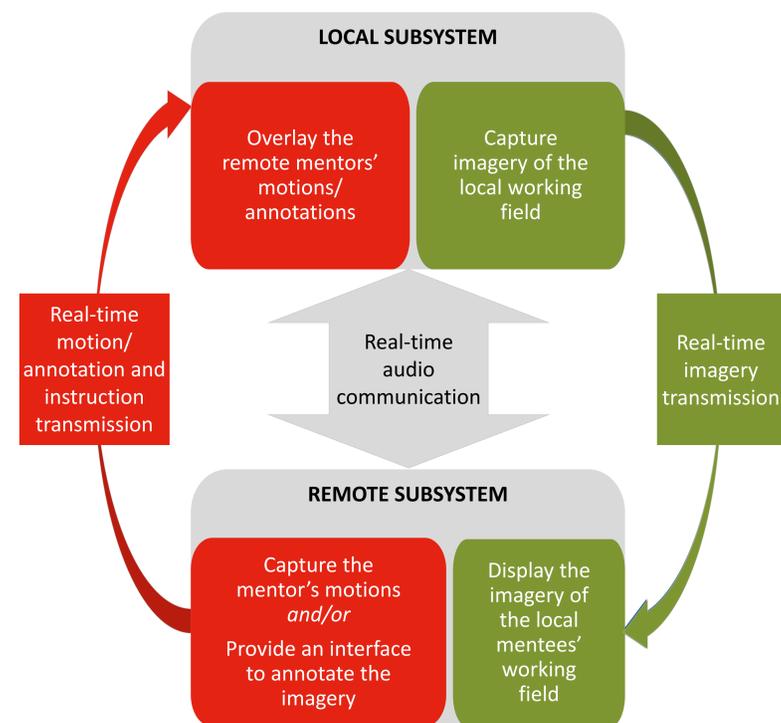
- Based on AR technology, the local mentee could communicate verbally to the remote mentor and view the operating field with relevant mentor-provided motions or annotations.

- The AR tele-mentoring systems provide the local mentees images of annotations, hand gestures, tool movements, or tool positions that were created by the remote mentors.

- The annotations consist of textual labels, icons of working instruments, or instructional visuals. These annotations could be predefined or directly drawn in real time.

Aim

Compare the learning outcomes of third-year nursing students receiving AR based tele-mentoring with traditional instructional methods for the management of a complex clinical care scenario.

Hypothesis (H$_o$)

There would be no significant difference in outcomes for students undertaking *HoloLens-based tele*-mentoring compared to face-to-face mentoring to perform a nursing care scenario under supervised, simulated conditions in a high-fidelity simulation laboratory

Method
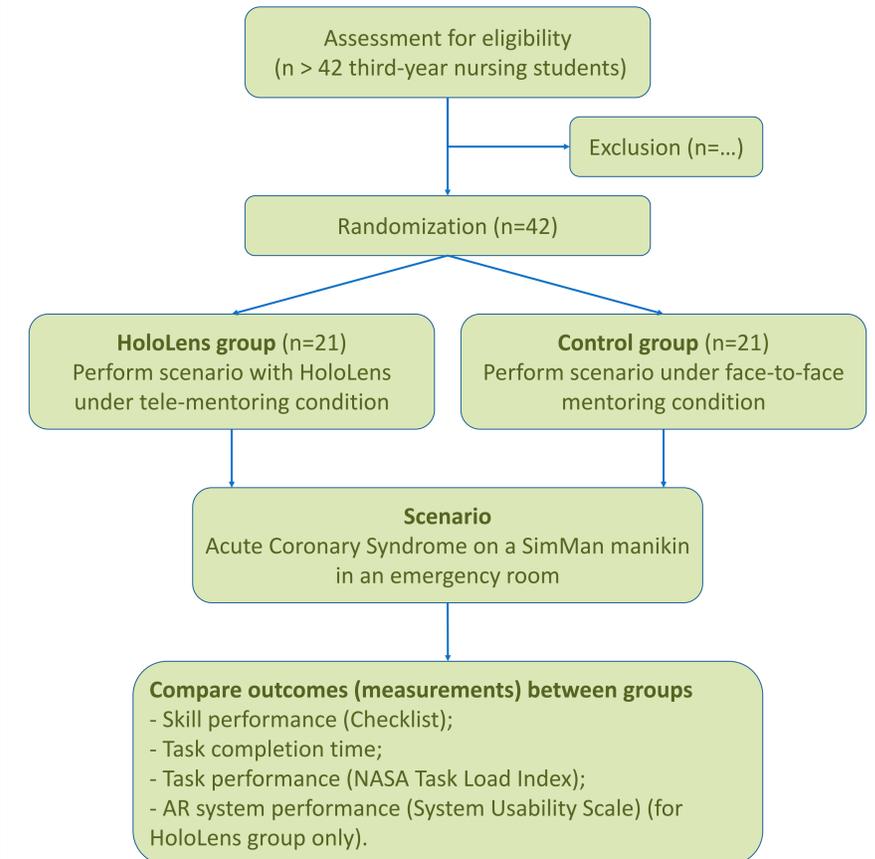
Significance

- Contributes to continuing medical education of rural and remote healthcare workers.

- Provides rural healthcare workers the access to expert professional guidance and instruction from a distance.

- Promotes understanding of the use of advanced educational technologies in remote assistance in rural health.

References

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