Chapter 4
Using a Virtual Learning Environment within Simulation to Enhance Inter-Professional Team Working Skills

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ABSTRACT

This chapter details a collaborative teaching and learning evaluative project between Nursing and Midwifery, Pharmacy, and Medicine at Keele University to explore the development of team working skills (NOTECH) and debrief within an inter-professional active virtual learning environment (KAVE). The virtual ward and NOTECH training provided within the KAVE are thought to be the first of their kind within the UK. The project has recently been presented within Australia and Italy, and been very positively received. KAVE is a physical room where three-dimensional "stereoscopic" visuals display on three walls and the floor to create a computer-generated virtual environment. A student wears active 3D glasses and a lightweight head and hand-tracking device. The computer-generated visuals respond to position in the KAVE and allow the student to "pick up" and interact with digital objects such as care plans, prescription charts, observation charts, etc. The virtual ward is able to simulate observation and diagnostic skills training. ECG monitors' provide information regarding the status of each virtual patient within the ward. The virtual ward clinical simulation enabled the students to rehearse professional behaviours in a risk-free environment, whilst providing opportunities for non-technical skills practice prior to real-world patient encounters. Early evaluations received from students have been very positive.

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1. INTRODUCTION

Technology in health-care education is here to stay. Today's students learn and study in the digital culture – where multitasking is not an issue and, in fact, seems to be the expectation! Educators are keen to provide new and innovative approaches, beyond didactic methods. Virtual reality provides an environment where repetition, visual, auditory and kinaesthetic simulation exist – where students can move and interact within this variety of stimuli - while learning.

The virtual ward has been developed to simulate interactions between health care students and a virtual patient group (or avatars). Students can immerse themselves within a clinical ward setting and practice team leadership, management and communication skills in a practical and ethically safe environment (Kirriemuir, 2009; Ziv et al, 2000). This enables students to make mistakes without repercussions or causing clinical harm to patients. Students can analyse and evaluate the scenarios encountered and work in collaboration utilising their non-technical skills to achieve common goals (Gokhale, 1995). Student groups undertake an initial 'handover' from another healthcare professional using the SBAR (Situation, Background, Assessment, Recommendation) (Resuscitation Council, 2011) method. The team of participants (6-8) move forward into the virtual ward and begin their own assessment of the situation. The principal goal of our project was to explore the potential for students to engage within inter-professional simulation through a virtual learning environment. This facilitated students to engage in a natural language conversation with both their team and the patients to obtain relevant patient history, symptoms, etc, and then to develop pathways of care appropriate for the simulated condition of the patients.

Students were given a framework to work within in order to enhance the development of non-technical skills (NOTECH); and to advance the development of multi-professional communication within medication management (Figure 1). Following the facilitated scenario all involved participate within the structured debrief (Jeffries, 2005). Within evaluation of the project the team sought to discuss potential and concern of inter-professional learning within a virtual learning environment.

2. PROCESS PLANNING

The team undertook the advancement of this technological innovation through commitment and the sharing of a common goal – to develop inter-professional team working skills to provide safe and ethical patient care. The health care system for which the students are being prepared for is increasingly complex; the virtual learning hospital ward set the stage for students to work within authentic problems, synthesis data, make team decisions and reflect on their practice. Despite improvements in the safety of healthcare practice, (lack of) communication continues to have a substantial role in adverse outcomes (Campbell and Daley, 2013). Within the virtual hospital ward (Keele Active Virtual Environment KAVE) risk to patients is eliminated and learning becomes paramount; a unique and outstanding feature of the application of this innovation. The collaborative team makeup represented not only the student backgrounds; but also the needs of designing the unique learning activities (Technologist, Human Factors expert, and Simulation lead). Each member within the team participated fully and undertook an important role towards stimulating creative design and actualising enhanced student performance. This work has received great interest both nationally and internationally, and is the only one of its kind within the UK.

A video walkthrough of the Virtual Ward created by the team for the teaching application can be viewed here: http://youtu.be/1Pxo1X2BGKc. This side of the project has been led by technology team. In order for the common goal to be