

## Background

Current students accessing higher education are technologically savvy and possess learning styles which vary considerably to their previous counterparts. Consequently, academic institutions must expand their pedagogical repertoire, in order to remain contemporary and cost-efficient (McCutcheon *et al.*, 2014). However, within healthcare education the increased focus on patient safety suggests that certain aspects of practice need to be repeatedly reinforced, and opportunities must be made available in order for students to develop competence in clinical skills. Neurological observations are one of the skills that need to be performed by appropriately trained staff and recorded accurately (NICE, 2014), as acute neurological conditions have an urgency that makes their rapid diagnosis and treatment crucial for improving outcomes.

Blended learning incorporating face-to-face teaching, online learning activities and high-fidelity simulation aim to strengthen knowledge and help students to relate theory to practice (Doyle *et al.*, 2017). However, it is essential to examine the effectiveness of such innovative approaches in terms of student learning, changes in behaviour and educational outcomes. Therefore, the blended learning approach to teaching neurological observations is being explored through a collaborative project involving clinicians and academics, which utilises online resources, traditional didactic lectures, and human simulation with year two undergraduate nursing students.

## Online self directed learning

Healthcare education providers are increasingly faced with large cohorts of students, and must therefore use alternative ways of teaching and technology to ensure that healthcare students acquire the knowledge and behaviours needed to improve patient outcomes, safety & experience (DOH, 2011). Technology enhanced learning (TEL) is one solution, and using technology to enhance and support learning, teaching and student experience has gained increased momentum in recent years (Rapp *et al.*, 2016). For this project, learning materials in the form of posters, podcasts and videos were created to support traditional didactic and simulation teaching strategies. These were hosted on the "Skills for Practice" website, which provided flexibility and enabled students to access these resources, anytime, anywhere, on any device.



## Methods

The mixed methods will include session evaluations to assess reactions; pre and post session questionnaires will be used to assess learning; focus groups will be conducted at the end of all three sessions and at the end of their acute placement to assess behaviour; outcomes will be explored within focus groups at the end of their placement for students who have completed neurological observations during their placement.

All 300 nursing students undertaking the level 5 acute/critical care nursing module (NS0516) will be asked to complete questionnaires and an evaluation at the end of the sessions. The sample for the focus groups will include a minimum of 15 students.

## Practical simulation

Simulation education is a bridge between classroom learning and real-life clinical experience and has the ability to provide students with authentic learning opportunities that foster engagement and deep learning (DOH, 2011). It is a teaching method which can be used to improve the safety and effectiveness, by increasing self confidence and knowledge (Griswold *et al.*, 2012). This project included the use of role play and human simulation in an environment which resembled clinical practice. This enabled a more realistic and real time experience, allowing for development of technical and non technical skills. Special effects moulage makeup was also used to simulate injuries and potential signs of a head injury, which added another dimension of reality and allowed students to practice communication and therapeutic techniques.



## Classroom based knowledge transfer

Lectures and didactic approaches to information transmission is a long held tradition within higher education institutions. Whilst debates about the effectiveness of this teaching medium are ongoing, what has been agreed, it that when knowledge transfer is undertaken by academics who are experts in the field, have the ability to explain concepts in simplistic and more relatable terms, and are also charismatic teachers, information exchange and retention can be achieved (Schmidt *et al.*, 2015). For this research project, a lecturer with all of the above qualities, undertook a two hour didactic lecture with large groups of year two undergraduate nursing students. With the addition use of pre and post lecture self directed study, this teaching medium provided an opportunity to enhance theory integration and also provide links to the TEL resources and simulated practice sessions.



## Study design

The Kirkpatrick model is being used as the theoretical framework to evaluate the blended learning approach as it is recognised as the most well known and utilised model to evaluate health care training programmes. The model consists of four criteria or levels of evaluation:

- Reaction – content, materials and delivery
- Learning – knowledge, skills and attitudes
- Behaviour - application of newly acquired skills/knowledge
- Outcomes - job performance, organisational change

(Kirkpatrick and Kirkpatrick, 2006)

## Way forward

The results from this research project will be published within academic journals and disseminated at clinical and education conferences, in an attempt to raise awareness of the strengths and limitations of using a blended learning approach, for the transfer of knowledge and level of skill competence. The results will also promote the use TEL and simulation initiatives and may inform future developments.