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Bridging the Theory Practice Gap through Clinical Simulations in a Nursing Under-Graduate Degree Program in Australia

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Abstract. The literature is inundated with articles discussing the theory practice gap but is less forthcoming about how to tackle this problem in the university classroom setting. This is an area which presents a recurring dilemma for nursing students and lecturers alike, as the theory at times seems to be distant from the clinical skills that a nurse requires for practice. Simulation is a flexible teaching method that can be adapted to meet both the program requirements and students' learning needs. A simulated environment ensures that the students learn in a safe environment that enables them to repetitively practice until competence is attained. We used simulation as a bridge to link the classroom (theoretical learning) and the clinical workplace (practice learning). The simulation task encouraged the use of critical reasoning and self-reflection, and provided students with opportunities to practice nursing in a controlled learning environment. The feedback we received highlighted enhanced levels of student understanding achieved through the clinical simulations, with indications of improved student preparation for clinical fieldwork.

Keywords: nursing education; simulation; theory-practice gap; clinical skills; undergraduate

Introduction

The literature is awash with articles discussing the theory practice gap (Corlett, 2000; Ousey & Gallagher, 2007; Scully, 2011; Hatlevik, 2012) but is less forthcoming about how to overcome this in classroom settings. Any efforts to address this issue must start with an understanding of some of the key challenges nurse educators face and an awareness of the potential for simulated learning activities to scaffold the students' learning experience in preparation for clinical practice.

The challenges for educators

The gap between nursing theory and nursing practice has been frequently mentioned in the research literature with Sandelands (1990) observing that these two ideas were mutually exclusive. Moreover, students often struggled to see the connection of the holistic grand theorists with the practical world of nursing.

Another dimension to this challenge was that theoretical developments informed by research often ran ahead of clinical practice. The theory practice gap created a tension that moved the profession forward over time – new knowledge led to new practices. From the student perspective the theory practice gap has been noted as demanding and sometimes left them confused and uncertain about their roles and practice (Corlett, 2000; Ousey & Gallagher, 2007).

The changing composition of students with diverse learning needs

The profile of the undergraduate nursing student has changed over the last three to four decades. Today's student nurses come from diverse backgrounds: students with English not as their first language, mature aged students, male and female, students without final year secondary education completion, those with degrees in other disciplines, those working full time and studying part time, in addition to the traditional school leaver (Bradley, Noonan, Nugent & Scales, 2008). Educators need to engage this diverse student group using technology and innovative approaches to teaching that is experiential and builds upon essential professional knowledge and develops skills.

The need to refocus on the primacy of practice

The challenge has been further complicated by the prominence of theoretical aspects of learning, with Rolfe (2006) noting this overemphasis on nursing theory when advocating his model of nursing praxis. The clinical nurse may not even be aware of the debate that goes on about the various nursing theories, technical rationality and nursing praxis, but is very conscious of the quality and practical ability of the nursing students that universities are responsible for. This situation creates an additional tension as the clinical nurses juggle their own patient load while offering support for students; with perceptions on both sides that student's needs are at times neglected (Corlett, 2000).

The need to develop teaching that engages with practice realities

Being able to demonstrate skills in the artificial clinical classroom does not prepare a student for the reality of utilising them with a vulnerable patient who is ill. As highlighted by Corlett (2000) it was not the actual learning of the skills that was the problem for the students, it was the application of them. Making the same observation, Ousey and Gallagher (2007) noted the 'inability of the students themselves to transfer classroom learning to the clinical environment' (p. 201). In addition, Scully (2011) discussed the lack of sufficient time that the students had to practice their skills as well as the importance of learning both reflection and critical reasoning skills. We believe that simulation can help to address some of the challenges outlined above.

Scaffolding learning through simulation

Simulation provides a means of scaffolding student learning and has been used widely in nursing education, extending from human actors role playing through to artificial simulators, with the range and fidelity of the simulators varying (Gough, Hellaby, Jones & MacKinnon, 2012; Dearmon et al., 2013). Simulation learning evokes structured reflection on practice to bridge the gap between educational theory and clinical practice (Corlett, 2000; Rolfe, 2006), and promote the development of critical reasoning (Jeffries, 2005; Hatlevik, 2012; McCormick, Romero de Slavy & Fuller, 2013).

Simulation as a learning strategy

The use of simulation within nursing curricula provides a flexible learning and teaching model that can be developed to meet specific learning aims and objectives (Jeffries, 2005). Students can practice repeatedly in a controlled environment to gain confidence and develop skills. Simulation has the added benefits of being able to teach students those skills that they may come across infrequently, and be otherwise impractical to set up (Hope, Garside, & Prescott, 2010).

Students expressed a positive attitude to learning through simulation with improvements in confidence and competence (Hope et al., 2011; Gough et al., 2012; Dearmon, et al., 2013). Similarly the feedback from academics who utilised simulation as a teaching model have described it as useful in meeting the needs of students with variable learning requirements as well as building team work and improving communication (Jeffries, 2005; Dearmon et al., 2013).

The use of simulation as a learning strategy also provided opportunities for the student to learn and practice while developing deeper understanding. Sandelands (1990) noted the meaning of understanding as not just grasping the concept but being able to do things with that understanding. In particular, to be able to use understanding, apply reasoning and questioning to changing conditions and circumstances. In addition he also stated that "the growth and development of understanding is grasped most easily when it is manifested as an observable skill" (Sandelands, 1990, p. 240) and continued on to discuss how this 'understanding' developed with experience and practice.

Therefore, simulation provides ways and means of enhancing student learning by engaging students more fully in situations that mirror real life clinical circumstances. It facilitates the development of a richer understanding of clinical work in a safe and structured way (McCormick, Romero de Slavy & Fuller, 2013). The following sections describe an example of a low fidelity simulation task that was used to help students link theory to practice.

An example of simulation activity in teaching practice

The Bachelor of Nursing program is a three year undergraduate degree, completed over six semesters and compliant with the Australian Nursing and Midwifery Council competency standards (ANMC, 2009). Each semester students complete theoretical units at the university and then apply this learning during a three week clinical practice unit in a health care facility.

The students

A cohort of 88 second year students was engaged in a simulation task. These students had received theoretical teaching on respiratory, cardiothoracic, endocrinal, vascular, renal and shock management, and were preparing for their medical/surgical clinical placement. The objective of the simulation task was to reinforce this learning, teach the application of clinical skills and enhance clinical thinking, in preparation for clinical practicum.

The Learning Environment
A simulated hospital setting at the university provided the students with the environment to address the simulation challenges described in Table 1 and based on core learning content. The students were briefed for the simulation over the two weeks prior to the activity, by making them aware that the activity would involve the application of learning taught throughout the semester. This cohort of students had no prior exposure to this level of simulation. There was an air of excitement in the student group and they appeared engaged and motivated to learn.

The simulation task in the classroom
The simulations were conducted during tutorial time, across the last two weeks of the semester prior to clinical placements. The normal tutorial composition of 20 students was deemed to be too many for a single simulation so the tutorial group was divided in half; with two simulations conducted concurrently in separate clinical classrooms. Each tutor had 5 students taking part in the simulation, while 5 students observed. In the following week these observers and participants swapped places to complete the second simulation. Therefore every student in the class actively participated in a simulation.

Both of the simulation tasks were low fidelity and used a non-programmable manikin (Laerdal®, MegaCode Kelly™) where the tutor directed the group of 5 students in a simulation that involved monitoring and providing care for a 'patient' whose condition gradually deteriorated requiring intervention. The level of deterioration eventually led to an emergency situation requiring firstly a Medical Emergency Team (MET) response and then a cardiac arrest requiring Basic Life Support (BLS).

The students engaged with the simulation
At the commencement of the simulation the student group was asked to nominate a team leader. This student was responsible for allocating tasks and coordinating the team throughout the activity. One of the strategies built into the simulation included the removal of the team leader if he/she became too dominant. In three separate instances this was required. The dominant student was requested to attend to a phone call in a separate area, which allowed the rest of the team to make their own decisions and manage this new circumstance.

The simulation scenario mirrored clinical reality and commenced with the team leader collecting the patient from the post anaesthetic care unit (under the supervision of the tutor role playing a Registered Nurse), and returning to the surgical ward. The team leader provided a handover to the team who commenced with the routine postoperative management including patient assessment and vital signs. Over the next 30 minutes the patient condition deteriorated requiring more complex assessment and interventions (see table 1).

Table 1. The first simulation: The patient: 55 year old male, no relevant past history. Post-operative laparoscopic cholecystectomy

Psychomotor skill challenge	Critical reasoning skill challenge
Assess vital signs: TPR, BP, SpO_2, level of consciousness	Demonstrate intra-team communication
Patient assessment: including recognition of hypovolemic shock	Develop ability to delegate (both as a team leader and team member)
Oxygen therapy: assess and manage airway (including identify and apply the correct oxygen delivery mask, insertion of an airway and bag valve ventilation)	Extend skills in the prioritisation of care
IV therapy: assess and manage (including IV pump programming/priming/ equipment trouble-shooting)	Extend skills in time management
Pain: assess and manage (including PCA management/equipment trouble-shooting)	Demonstrate ability to engage as a team member
Nausea: assess and manage (including medication calculation and administration of medication)	Manage increasing stress levels (as the patient's condition deteriorates)
Wound: assess and manage (including post-operative wound care, observing wound ooze and reinforcing dressing).	Develop patient- nurse communication skills
Medical Emergency Team (MET): Identification of a patient meeting the criteria for a MET call, initiating call.	Practice interdisciplinary communication between medical staff and nursing staff
Basic life support (BLS): following BLS algorithm	Develop aptitude for self-reflection

The tutor coordinated the simulation and provided the patient's observations (consistent with hypovolemic shock). They role played the patient's verbal responses to the student's questions. The tutor also made minor interventions to change the clinical circumstances which the team was presented with. On occasion the tutor also halted the activity in order to conduct further learning. For example when the patient's SpO_2 deteriorated one group of students only considered increasing the oxygen flow which required the tutor to halt the activity and facilitate a discussion on alternative oxygen delivery systems, and the benefits of re-positioning the patient.

The simulations gave the students the opportunities to not only communicate with the patient, the patient's family, and the doctor but also to communicate

within the group. This was an essential requirement in the simulation task – they had to work as a team. Often the students would problem solve themselves verbalising their uncertainties and seeking assurances that they were making the correct decisions. Some students would offer prompts and advice to each other, allowing discussion about alternative options.

Group communication helped the students to work together as a team. The simulation task created a different mode of group work to what might normally occur in a classroom tutorial. It was more student-centred and each participant had to engage with the activity. It was more demanding of the student. For example, students could delegate tasks to individuals or alternatively work together to achieve time critical events. Owing to the deteriorating condition of the patient, students needed to carry out simultaneous care with one student taking observations while another had to reinforce the patient's dressing.

The structure of the simulation meant that learning opportunities were in some part dependent upon the students' contributions and interactions. In contrast to solely teacher-led lectures and tutorials, the simulations provided an opportunity for learning to be student focused (Jeffries, 2005), drawing on their shared knowledge and understanding in an applied manner.

As the simulation unfolded and the patient deteriorated the students worked as a team to prioritise care, think critically and apply their previous knowledge and skills. They engaged with the simulation and with each other as team members. The clinical classroom was full of energy and students appeared to learn in a dynamic environment, alert, ready and engaged. The tutors were able to manage the progression of the simulation to allow all students an opportunity to be responsible for different elements of care.

At the conclusion of the simulation an informal debrief was undertaken which included contributions from the team and observing students. Tutors were careful to ensure that all feedback was given in a positive and constructive manner. Each simulation group spent a few minutes after the simulation discussing different issues, before re-joining as a full tutorial class where they took the opportunity to release their stress as well as acknowledge that it had been a very positive learning experience.

What emerged from the simulation task activity?

The original intention was to use simulation to help students build stronger links between theoretical and clinical practice. A vital aspect of the simulation activity was the emphasis on changing information into understanding (Hope et al., 2011). By developing this understanding, the student would then able to apply this information when confronted by new situations.

Table 2. Synopsis of the reactions of students and tutors to simulation based activities in class

Student themes	Tutor themes
Confidence increased through applying skills in a realistic situation	Generated positive emotions observing the students growing in confidence
Ability to link medical/surgical concepts to clinical skill practice	Activity challenging for the students
Generated a range of positive emotions – 'awesome', 'fun', 'stimulating', 'interesting'.	Activity required a lot of effort and time to plan/organise/deliver
Felt stressful but able to recognise the benefits of being challenged	Students appeared to be engaged throughout activity
Helped to prepare for practicum	Required an extra tutor, therefore extra cost incurred
	Learning objectives needed to be clearer
	Identified the need for a formal de-brief tool.

Feedback was generally very favourable (see Table 2). Students stated that they loved the simulations, describing them as instructive, developmental and fun. Some students indicated that they felt quite a high degree of pressure and stress, but understood the need for this as they prepared for their medical/surgical placement. Feedback collected from the tutors led to a couple of changes for the simulation the following week; these included more focused objectives, a decrease in the critical care component and an increase in medical/surgical component. Unlike the first simulation the second one did not result in a cardiac arrest but required the students to prepare the patient urgently for operating theatre due to a deteriorating condition.

Our reflections

An extra tutor was needed which created new challenges in coordinating double the usual number of staff (we ran two simulations concurrently); as well as the extra costs associated in financing the extra tutor. Planning meetings held before the simulations were vital for communication and that the exercise was a successful one which challenged and supported the students at the same time. Our review also highlighted the unrealistic situation of having 4 or 5 nursing students caring for a single patient. Proposals for future simulations now include greater levels of realism as well as containing costs.

Another area of improvement noted was the initial lack of very clear objectives. The plan is for the unit coordinator to refine these and have them ready for discussion with the tutors and the students before the start of the next semester. Careful planning and preparation includes: clear objectives, pre simulation brief for staff and students, realistic time allocation and the provision of essential information to the students prior to the exercise (Jeffries, 2005).

The final area of improvement required was the need for a formal debrief at the end of each simulation. Formal debriefs were recognised by Jeffries (2005) as significant for learning. During debrief there was also the opportunity to encourage the students to reflect on the simulation, noting areas of perceived weaknesses and strengths allowing the opportunity for their own future practice and development. As stated by Scully (2011) "ultimately the conscientious student must identify and accept their own weaknesses before utilising resources to rectify them and improve their practice to an optimal level" (p. 95).

Conclusion

This article described a simulation activity that utilised low fidelity mannequins to help undergraduate nursing students link theory and practice in preparation for a clinical placement. The students had the opportunity to practice psychomotor skills and develop critical reasoning in a controlled environment. Communications from students undertaking clinical practicum after the simulation activities, led us to believe that the simulation was especially useful in preparing them for clinical work. This is an area we plan to explore further within the curriculum.

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