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**Simulation in nursing education - international perspectives
and contemporary scope of practice**

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Review

Abstract

This article provides insights and perspectives from four experienced educators about their approaches to developing, delivering and evaluating impactful simulation learning experiences for undergraduate nurses. A case study format has been used to illustrate the commonalities and differences of where simulation has been positioned within curricula, with examples of specialised clinical domains and others with a more generic focus. The importance of pedagogy in developing and delivering simulations is highlighted in each case study. A range of learning theories appropriate for healthcare simulations are a reminder of the commonalities across theories and that no *one* theory can account for the engaging and impactful learning that simulation elicits.

Clinical relevance: Creating meaningful and robust learning experiences through simulation can benefit students' performance in subsequent clinical practice. The ability to rehearse particular clinical scenarios, which may be difficult to otherwise achieve, assists students in anticipating likely patient trajectories and understand how to respond to patients, relatives and others in the healthcare team.

Keywords: simulation; undergraduate nurses; pedagogy; holistic practice; mental health; medical surgical

Introduction

There is a plethora of reports about the use of simulation for healthcare education particularly within undergraduate nursing curricula. The attraction of using simulation as an educational strategy arises from the ability to: incorporate multiple elements of practice within a learner centred activity; address national health priorities and; trigger participants' reflection on and about practice. At an individual level, simulation can enhance students' understanding of the roles and responsibilities of the registered nurse through, to use Bourdieu's (1990) expression, forming a habitus of perceptual acuity leading to skilled, embodied practice.

The intent of assembling the chosen case studies within one article is to highlight similarities internationally in the intent and approaches in developing meaningful simulation experiences. The fundamental importance of incorporating sound pedagogical design and relevant theories is demonstrated in each of the case studies. Details of the simulation delivery may not be explicit in all case studies, suffice to say that all four experienced simulation educators followed best practices (Arthur, Levett-Jones, & Kable, 2013; Jeffries, 2007, 2014). The

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3 range of scenario topics highlights the flexibility of simulation as a learning approach, from
4 understanding others' roles within the healthcare team (author 2); appreciating the salient
5 aspects of post-operative patient care (author 3); increasing insight and empathy about mental
6 health issues (author 4); and understanding how to manage critically ill patients within a team
7 context prior to entering clinical practice (author 1).
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11 What emerges from these case study examples is how simulation enables co-production of
12 knowledge, and how insights from studies of other disciplines within and beyond health can
13 inform and guide simulation practices.
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17 18 **Cast study 1: Low fidelity inter-professional ward simulation**

19 At the University of XX in the United Kingdom (UK), we have offered an inter-professional
20 health and social care curriculum since 2000 involving ten pre-qualifying professional
21 programs. Evidence from internal (Pollard, Miers, & Gilchrist, 2005) and external (Salfi,
22 Solomon, Allen, Mohaupt, & Patterson, 2012) studies reinforce the argument for including
23 inter-professional education (IPE) in pre-qualifying curricula which is mandatory in the UK
24 (Department of Health & Quality Assurance Agency, 2006). Given some of the challenges
25 highlighted and conclusions drawn by Pollard et al. (2004) about students' perceptions of IPE,
26 I was interested in discovering how simulation might enhance the delivery of IPE . IP
27 simulation learning experiences are increasingly more common with a focus on enhancing
28 non-technical skills, such as communication and collaboration (Reeves, Lewin, Espin, &
29 Zwarenstein, 2010).
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32 For health and social care students, it is essential that the impact of human factors and the
33 importance of patient safety are addressed within the curriculum. This project embraces the
34 recommendations of the "Shape of Caring" (Willis, 2015) and "The Better Training Better
35 Care programme" (Health Education England, 2014) and recognises the need for healthcare
36 and social care students to learn to work together through educational initiatives in order to
37 deliver safe and effective care (Francis, 2013; Willis Commission, 2012).
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40 41 **The Project – an outline**

42 The purpose of the project was to offer an inter-disciplinary simulation experience to final
43 year nursing and medical students which focused upon patient situations that they would
44 encounter in clinical practice. The simulation offered participants the opportunity to identify
45 and prioritise patient care, manage and delegate clinical tasks and work together to ensure
46 efficiency and patient safety.
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3 The project took place in a simulated environment (a ward at night) at xx university with eight
4 simulated patients (4 acting roles and 4 manikins). Each patient had a full history with a
5 developing clinical picture as each of the three phases of the simulation unfolded. At each
6 phase two medical and two nursing students ran the simulated ward together. Other students
7 acted as observers or patients in the scenario. Facilitators took on roles as a patient's family
8 member and as a ward manager and medical registrar. Verbal patient handovers were given to
9 students at the start of each phase and between role changes. A maximum of twelve students
10 took part in each half day session. Nursing students worked as newly qualified nurses
11 managing the ward, assessing patients, delegating tasks, calling the doctor to raise concerns
12 and initiating acute care. Medical students worked as the junior doctor on-call; triaging
13 bleeps, undertaking a variety of ward jobs, and managing sick patients. At the end of each
14 phase all students and facilitators left the ward and debriefing of the activity took place
15 nearby. At each debriefing point experiences and issues that had emerged were discussed and
16 suggestions, solutions and learning points were shared. All facilitators and students took part
17 in the feedback and debriefing points which each lasted approximately 30 minutes.

30 **Results**

31 Students were asked to self-rate their confidence on: receiving handovers; prioritising tasks;
32 communicating with medical and nursing colleagues and; calling for help; on pre-tested 10
33 point Likert scales, before and after the simulation. Students were also asked to rate the
34 session (free text responses) compared to previous experiences within their curricula
35 involving multidisciplinary team (MDT) learning.

36 Qualitative and quantitative data collected from participants convincingly suggested that the
37 inter-disciplinary ward simulation offered a very effective way of improving confidence in
38 prioritisation and on-call skills. It was also a preferred method of understanding the different
39 and complementary roles of nurses and doctors, and how to support each other to promote
40 patient safety.

41 One quote summarised the general consensus of students' opinions about the value of
42 this activity for future practice experiences:

43 *"The simulation itself really helped me to see how nursing and medical roles*
44 *are so different but both vital in giving patients good care. The practical parts*
45 *were long enough to really get into them and think about how best to prioritize*
46 *patients. The debriefing sessions allowed us to share concerns and ask*
47 *questions in a safe environment, it was really helpful to see how implementing*

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3 *the suggested changes made such a difference to the outcome of the shift each*
4 *time. It was also quite comforting to know that newly qualified medical*
5 *students are also just as scared as we are when we first start, which shows how*
6 *much more we need to help each other!”*
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10 (Third year nursing student).

11 This project also showed the effectiveness of students acting as patients in the scenarios
12 allowing them a fresh perspective of inter-disciplinary work, helped decrease running costs
13 with greater student engagement, and was testament to my belief, often cited by students, that
14 ‘simulation learning is fun’. This in turn reduced some initial student anxiety and contributed
15 to a friendly and positive learning environment in which participants reacted and responded
16 authentically to the unfolding scenario.
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21 **Discussion**

22 The Carnegie Foundation for the advancement of teaching in the USA has funded studies into
23 the education of professionals (Benner & Sutphen, 2007; Foster, Dahill, Golemon, &
24 Tolentino, 2005). The Foundation, drawing upon internal and external professional
25 perspectives and cross-professional comparisons, sought to elucidate teaching and learning
26 for professions practice.
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29 According to Foster et al., (2005) professional education emphasizes the importance of
30 ‘professional identity, practice, commitment and integrity’ (p.100). For clergy education,
31 seminary students are encouraged to view themselves as part of the narrative of the
32 profession. The ability to recognise, explore and interpret their own dispositions, beliefs,
33 knowledge and skills is seen as essential to discernment and action in particular situations
34 (Foster et al., 2005). This resonates with my vision of health care education and the need for
35 students to learn to be self-aware professional practitioners able to contextualise a particular
36 situation and act with integrity and advocacy for their patients. All of the Carnegie
37 Foundation studies draw upon three high-level ‘apprenticeships’, knowledge, skill and ethical
38 conduct, which they suggest are required for all professional practice. Through these
39 ‘apprenticeships’ Shulman (in Benner et al., 2009) suggests that novices should be introduced
40 to the meaning of integrated practice which incorporates all dimensions of the profession.
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43 It is important to highlight that ‘apprenticeship’ in this context is not used as reference to
44 where learners are employed and work alongside skilled practitioners. In the Carnegie studies,
45 apprenticeship is used as a metaphor for the complex embodied, cognitive, skilful, ethical and
46 experiential learning required in practice disciplines (Benner & Sutphen, 2007). The notion of
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3 apprenticeship is useful in professional education. Learning a complex practice, in which
4 knowledge is situated and socially embedded, demands practical reasoning, skilled know-
5 how, perceptual acuity, relational and communication skills, and ethical conduct (Benner,
6 Tanner, & Chesla, 2009). Such integrated practice is learned in formal programmes and also
7 through experiential learning (Lave & Wenger, 1991). In nursing and medicine, knowledge,
8 skill and ethical conduct must be integrated into all teaching and learning situations and can
9 be more fully understood through the pedagogies of interpretation, formation,
10 contextualisation and performance.
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17 The different pedagogies provide a framework for developing an understanding about the
18 impact of simulation upon learning for student nurses (Berragan, 2014). As an educator, I
19 recognise that often we offer a linear or step by step approach to introduce students to clinical
20 skills. This exemplifies what Benner and Sutphen (2007) call a narrow, technical rationality.
21 In order to move away from this and engage with a broader version of 'rationality' where
22 interpretation, understanding and relationship are key to engaging students and helping them
23 to learn to be nurses and doctors, these pedagogies offer potential. They offer an expansive
24 approach to learning and a means of interpreting and exploring the impact of simulation for
25 learning key aspects of inter-professional care.
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31 Learning together and understanding co-workers' roles, challenges and limitations, we hope
32 to foster more effective interdisciplinary communication and in turn improve patient safety.
33 This project demonstrates that on-call ward simulation is an effective and achievable way of
34 delivering this.
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39 **Case study 2: post-operative simulation for Norwegian nursing students**

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41 Like many other countries, nurses in Norway are prepared to Bachelor level over 3 years at
42 universities or regional colleges. Nursing curricula are based on national regulations with
43 some variations at the institutional level in program delivery. All programs include theoretical
44 and clinical learning components. Ten weeks (15 European Credit Transfer and Accumulation
45 System) of the 3 years is for *training and reflection upon practical skills*, mostly worked on in
46 the simulation laboratory (Ministry of Education and Research, 2008).
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51 At the University of X, simulation-based learning (SBL) is the most applied pedagogical
52 method for learning multiple nursing skills, for example to administer drugs intravenously,
53 parenteral nutrition and post-operative skills. The method is recognised as student-centred,
54 interactive and beneficial in preparing students for real-world patient care experiences (Cant
55 & Cooper, 2010). The *didactic model of relation* (Hiim & Hippe, 1998) makes explicit the
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3 most important factors for planning simulation activities, in this case the post-operative care
4 course. Of particular importance is the interconnectedness between the six factors identified
5 within the model. All factors are mutually dependent meaning that changes in one have
6 consequences for the other factors (Figure 1).
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10 Discussion follows about the planning for the post-operative simulation learning experience
11 for students in relation to the factors within this model. Hiim and Hippe (1998) do not
12 explicitly recommend which one of the factors to start with, but in their descriptions
13 commence with *initial situation of the learner* and continue with *frameworks* and so on.
14 Similarly, commentary about the application of the framework for this case example will
15 follow the same steps.
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20 21 **Initial situation of the learner**

22 A review of the *initial situation of learners* includes acknowledgement of their background
23 and skills, experience, motivation, and if students see the benefit and have ownership of a
24 particular course. Hiim and Hippe (1998) emphasise the importance of responding to the
25 learner at their own level of experience. These considerations resulted in production of an
26 electronic course booklet which students could access prior to the post-operative simulation
27 activity.
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33 34 **Frameworks**

35 Frameworks include all the conditions connected to the course design such as faculty
36 background, competence and experience (Hiim & Hippe, 1998). In this respect, the faculty
37 involved in the course have a background in nursing, education and facilitation of learning in
38 academic and clinical settings. To ensure that the course has relevance to clinical practice,
39 practicing nurses have reviewed and ratified the simulation scenarios. Attention to these types
40 of frameworks provides a solid foundation for meaningful learning experiences.
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46 47 **Goals**

48 The goals for the post-operative nursing course were to: a) be able to attend patients`
49 reactions and the need for nursing care following surgical treatment, b) understand the most
50 widely used therapies, with emphasis on surgical intervention and c) attend, observe,
51 document and report signs and symptoms post-operatively that are important for patient safety
52 and that can prevent inquiry. In addition, the learning objectives of the simulation scenario
53 included *communication and working in teams*.
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Content and material

The *content* refers to the theoretical components and intent of the course, both in subject matter and materials. In developing the 'what' aspect of the course, the following main topics were made explicit: post-operative observations and interventions, complications, pain, nausea, nursing skills and outpatient surgery. The course is structured in three steps comprising theory, skills proficiency and team-based simulation. In the first step, lectures on pre-, peri- and post-operative nursing are conducted. In the second step, the skills proficiency focuses on individual learning (with 1 facilitator overseeing 10 students), specifically on for example wound care and removal of sutures. The last step is the team-based simulation (6 students) where the scenario is based on a de-identified but real patient case to ensure clinical relevance.

The scenario addressed post-operative care of a 39-year old female patient, who has undergone a total hysterectomy and experienced a fall in blood pressure relating to hypovolaemia. When the scenario starts, the patient (manikin) has just arrived at the gynaecology unit and complains of pain and nausea. The patient has an abdominal incision covered by a wound dressing. She received one and a half litres of intravenous fluid during the operation with an estimated blood loss during surgery of half a litre. The patient was in the recovery unit for two and a half hours before admission to the gynaecology unit and had a urinary catheter insitu with approximately 200 mL in the urine collection bag. She received pain relief immediately prior to transfer from the recovery unit but did not have a patient controlled analgesia (PCA) regime in place because there was no pump available at the time.

Working processes and methods

In recognition of the benefits of SBL, pedagogical methods were chosen that focused on students as active participants in the learning processes. The methods included SBL in the skills proficiency and team-based simulation steps (described previously) where the latter comprised briefing, simulation scenario and debriefing (Husebø, 2012). Adequate staff training and understanding of how to facilitate these steps was ensured prior to delivering the learning activities.

Assessment

It was essential to determine what was to be assessed, how to assess it and the rationale for the assessment choices (Hiim & Hippe, 1998). Evaluation can be seen as having two interrelated functions, i.e. formative and summative evaluation. The objective of formative

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3 assessment is to monitor student learning to provide ongoing feedback that can help students
4 identify their strengths and weaknesses and target areas that need work; and help faculty
5 recognize where students are struggling so that problems can be addressed immediately
6 (Mahara, 1998). With this in mind, during the skill training and simulation scenario, faculty
7 provide ongoing feedback to support achievement of students' learning objectives. Reflection
8 on and about performance is a central part of the training sessions and students should be
9 encouraged to provide feedback of their SBL experiences (Husebø, O'Regan, & Nestel, 2015).
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16 The students undertook summative assessment in the simulation laboratory before entering
17 their surgical clinical practice. The goal of summative assessment is to evaluate student
18 learning at the end of an instructional unit by comparing it against some standard or
19 benchmark. To evaluate performance of nursing skills, the Model of Practical Skill
20 Performance by Bjørk (1999), which consists of 1) substance and sequence, 2) accuracy, 3)
21 fluency, 4) integration and 5) caring component was applied to the assessment criteria.
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26 The *didactic model of relation* is a structured, easy-to-follow didactic model, which appears
27 to be applicable in most simulation-based courses in nursing education. The model
28 emphasizes several critical components for learning with the intent of optimizing student
29 performance during clinical practice.
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33 **Case study 3: Collaboration for Practice: a hearing voices simulation workshop for** 34 **Australian nursing students**

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37 Mental health is recognised as an integral component of a person's overall health (World
38 Health Organisation, 2015). However, the concept and experiences of mental illness can be
39 confronting for nursing students. One approach to prepare students for collaborative practice
40 with healthcare consumers is to engage consumers of mental health services - those with lived
41 experience of mental illness and mental health services and who are experts by experience –
42 as curriculum consultants and as academics. The reported benefits of this approach include:
43 increased awareness of recovery from mental illness, reduction in stigma and positively
44 influencing attitudes (Byrne, Platania-Phung, Happell, Harris, & Bradshaw, 2015).
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51 Increasing nursing students' understanding of voice-hearing can also be achieved by
52 including consumers' lived experiences in learning and teaching approaches. Voices that are
53 distressing or difficult to cope with may be experienced by some consumers of mental health
54 services. To prepare students for practice, a hearing voices simulation (HVS), developed by
55 Deegan (2006), an academic and consumer with lived experience, has been used in a number
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3 of nursing programs. The benefits of the HVS include awareness of voice-hearing experiences
4 (Hamilton Wilson et al., 2009), decreased negative attitudes about people who have
5 schizophrenia (Sideras, McKenzie, Noone, Dieckmann, & Allen, 2015) empathy for those
6 who hear voices (Orr, Kellehear, Armari, Pearson, & Holmers, 2013).
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9 10 **Collaboration and Development of the Hearing Voices Simulation Workshop**

11 The HVS workshop developed by xx et al (year) was initially implemented at the University
12 of xx for 80 final year nursing students undertaking an elective subject in mental health
13 nursing. It is a unique collaboration between mental health nursing academics and consumer
14 consultants who were trained in the use of the HVS by Patricia Deegan. Mp3 players were
15 purchased for program delivery to students, and the simulated voices audio-recording was
16 copied onto the mp3s by the consumer consultants.
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19 To complement the HVS, the consumer consultants developed a 50-minute presentation on
20 voice-hearing experiences and coping strategies, and an overview of the aims of the HVS
21 workshop. This presentation was A-V recorded for students to view prior to the HVS.
22 Evaluation of this HVS workshop revealed it had increased students' awareness of voice-
23 hearing experiences (authors, year). Consequently, approval and funding was forthcoming
24 from management to embed the HVS workshop in the core, final year mental health nursing
25 subject for approximately 600 nursing students.
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28 29 **Implementing the Hearing Voices Simulation Workshop in a Large Core Subject**

30 The workshop was conducted during one week in the scheduled tutorials in the final year
31 mental health nursing subject. There were approximately twenty tutorials to manage and
32 staffing for each tutorial was increased to two academics, who were also mental health nurses.
33 Consumer consultant-led training in the use of the HVS was organised for academic staff
34 prior to the student workshops.
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37 In the tutorial prior to the HVS, students viewed the A-V recording on consumers'
38 experiences, discussed the issues raised, and the academics addressed students' questions and
39 concerns. In the following week's tutorials, the HVS workshop was conducted. The mp3s
40 were distributed and the students were instructed on the use of the equipment. To create a life-
41 like experience, students were asked to: use earpieces and set the volume so that the voices
42 were intrusive; suspend their disbelief and imagine that they were actually hearing voices;
43 resist the urge to discuss their voices with each other during the simulation; and listen to the
44 voices until they finished. The students were instructed to seek the assistance of one of the
45 two academic staff members if they felt distressed during the simulation
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3 The students listened to the simulation for 45 minutes whilst completing everyday activities in
4 and outside the tutorial room. The recordings comprised sounds and voices, including
5 derogatory comments. Initially all students completed a reading comprehension exercise in
6 the tutorial room, then the group was divided into two, to carry out the remaining activities
7 such as: interacting with others at a café on the campus, asking for information from the
8 library or student centre; phoning a friend who was not aware that they were participating in
9 the HVS; and participating in a discussion group in the tutorial room.

10
11 On completion of the simulation, all students returned to the tutorial room and the two
12 academic staff facilitated a 40-minute debriefing supportive of the students' experiences of
13 the simulation. Each student had an opportunity to reflect on the simulation, with particular
14 focus on how they felt and reacted during the range of activities. Discussions then focused on
15 how the experience could inform their future nursing practice with consumers who hear
16 voices, particularly the communication strategies that they might use.

24 25 **Kolb's Experiential Learning Theory and the Hearing Voices Simulation**

26 Kolb's (1984) theory of *Experiential Learning* (EL) underpins the student learning that takes
27 place during the HVS workshop. Learning by experience is central to Kolb's (1984) theory,
28 and the key components of the HVS workshop are consumers' experiences of voice-hearing
29 and student learning through the experience of a hearing voices simulation. The cycle of
30 learning described by Kolb (1984) includes four stages: a concrete experience; reflective
31 observation; conceptualisation; and active experimentation. The stages as applied to the HVS
32 workshop are summarised below:

- 33 i. a concrete experience, which comprises the consumer-led presentation on voice-
34 hearing experiences followed by engaging in the hearing voices simulation whilst
35 undertaking everyday activities;
 - 36 ii. reflective observation, which occurs during the large group debrief whereby the
37 students review their experiences of the simulation and consider how they were
38 affected emotionally, physically, cognitively and behaviourally.;
 - 39 iii. conceptualisation whereby students analyse the reflective experience and form
40 conclusions by considering what new ideas were learnt, and consider what they might
41 do differently when interacting with consumers who hear voices;
 - 42 iv. active experimentation whereby the students apply their learning to practice during 80
43 hours of subsequent facilitated mental health nursing clinical placement.
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3 The HVS workshop provided students with the opportunity to develop knowledge about
4 voice-hearing experiences and how it affects those who hear voices, enabling them to further
5 develop the skills of therapeutic responding, necessary for graduate nursing practice.
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8 **Evaluation and Impact on Learners**

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10 The HVS workshop embedded as a learning activity within a core mental health nursing
11 subject, was evaluated by the current cohort of students. This voluntary and anonymous
12 university-based evaluation was completed by 40% of students enrolled in the subject.
13
14 Students identified that overall the simulation increased their understanding of voice-hearing
15 experiences, captured how it felt to hear voices, offered insight they had not previously
16 acquired and encouraged them to talk with consumers about their voice-hearing experiences
17 during clinical placements.
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22 **Case study 4: Trauma simulations - discerning important elements of practice and** 23 **interrogating pedagogies**

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25 For several years, students undertaking a critical care elective subject towards the end of their
26 degree program, have been offered a simulation experience focussed on assessing and
27 managing a trauma patient. The intent of the specific scenario was to combine all elements of
28 skills practice, and clinical experiences of students who had undertaken the practicum, into a
29 holistic rehearsal of caring for a trauma patient. Student numbers across five tutorial classes
30 ranged from 20 to 25, comprising a total of approximately 125 students.
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36 **Simulation preparation and format**

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38 To orient the students to trauma management, a lecture followed by discussions of an in-class
39 case study which focussed on a patient in a car crash occurred the week prior. The subsequent
40 simulation scenario connected to the preparatory work and featured a 30 year old male who
41 was riding the motor cycle (featured in the case study) which crashed into the car. Students
42 were provided with preliminary patient information: burn injuries to the right side, sternal
43 bruising, lacerations and injuries to the left and right side of the body, helmet insitu, and that
44 he was found 100 metres from the motor bike. After treatment at the scene, the motor cycle
45 patient was transferred and admitted to an emergency department where the simulation
46 commenced. Up to eight students could participate in 'active' roles (see Table 1) while the
47 remaining 18 or so were asked to observe the simulation. The practicalities of delivering the
48 simulation resulted in the observer students being in the same room, separated visually by
49 partitions. To enable observation of the simulation, live video feed (without audio) was set up.
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3 The simulation commenced with the triage nurse (student) providing handover to a team of
4 three registered nurses (RNs) [students], one in a team leader (TL) role. Students then
5 performed a secondary patient assessment and proceeded to provide preliminary care. An
6 academic took on the role of the medical officer (MO) and determined when to enter the
7 scenario based on students' progression in the simulation. The intent was to allow students to
8 advance unaided through a head-to-toe but focussed assessment, influenced by the 'patient's'
9 vocal responses (another student – in the control room). In addition, the primary RN had to
10 work with the TL and other RNs to manage the entire situation including prioritising and
11 delegating tasks, gaining further information to assist with patient management whilst also
12 engaging and communicating with the team, patient and relatives.

13
14 As the scenario progressed, the patient reacted to medications, deteriorated and required
15 advanced life support measures including endotracheal intubation, the latter performed by the
16 MO (academic).

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18 After approximately 15 minutes, the scenario ended, students 'de-rolled' and a 25 – 30 minute
19 facilitated debriefing began using open-ended questions to trigger reflection about practice,
20 communication and leadership. Another phase of simulation followed, with other students
21 taking on roles to care for the same patient after transfer to the intensive care unit (ICU).
22 Similar issues with patient deterioration unfolded; students had to again prioritise patient care,
23 whilst working as a team, responding to the 'patient' and interacting with the relatives.
24 This scenario was offered (and refined) over a number of years and students reported they felt
25 engaged in the learning, were able to 'walk in the shoes' of the nurse or relative and could
26 appreciate the time critical nature in recognising and responding to a patient who was
27 deteriorating (author, year).

28 **Collaboration with other disciplines for greater insights about pedagogy**

29
30 In 2013, I invited four colleagues from the Faculty of Education to view these simulations to
31 provide additional perspectives about the pedagogical approaches in use. These colleagues
32 provided different and broader viewpoints about what and how students might be learning in
33 simulation, and the applicability for practice. At this time, the pedagogy of simulation was an
34 emerging area of interest. The opinions from experts in other disciplines both corroborated
35 and tested assumptions about student learning in simulation. A simple yet critical first
36 question put to the researcher group was "What is being simulated?" (authors, year). From
37 this platform, other problematics arose which elicited rich discussion and thought about what
38 was occurring and for whom in the simulations. Particular focus was directed to two
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3 elements: the large and culturally diverse student cohorts; and the experience for those
4 observing simulations.
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7 Initial seed funding through Education enabled some of these questions to be interrogated
8 through observational research methods. During simulations in the following year, the four
9 research colleagues, positioned at different viewpoints in the simulation lab, described how
10 students in their various roles engaged in the activities. A number of theoretical frameworks
11 to account for student learning were raised during subsequent discussions and analysis of the
12 research data.
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17 To start, authors (year) advocated that simulation enabled learners to engage in socio-material
18 (Schatzki, 2012) as well as socio-cultural performances (Gherardi & Perrotta, 2014). For
19 example, students initially considered the manikin as a *technical* or plastic person, prodding
20 the arm to determine how real it felt. As the scenario unfolded, interactions with the manikin
21 became *clinically* based as in giving medications and assessing pupil responses, to finally
22 taking on a *human* patient body as students demonstrated therapeutic touch while offering
23 empathic responses (authors, year). Such examples illustrate how simulation can trigger
24 emotional engagement in the learning as participants interact with each other and with
25 materials or environmental artifacts. Further, as the simulation unfolded and students become
26 immersed in the scenario, the manikin moved from being a plastic person in the bed to a
27 patient which students interacted with in meaningful ways. Vocal responses from the manikin
28 were key to this relationship building process. Without voice, the plastic body may remain
29 just that – rather than being incorporated into the doings and sayings of (simulated) practice.
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39 Further discussions amongst the research group presented the notion that simulation, through
40 embodied performances, can help novice nurses adapt and respond to the changing nature and
41 demands of work (within the scenario), in effect to become agile learners – to seek out
42 opportunities to learn and make judgements about their learning (R et al. anonymised for
43 blind review). This in turn may enable agile learners to become agile practitioners upon
44 graduation, engaging in socially established and recognised actions, sayings and doings (R et
45 al.).
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51 **Areas for further investigation**

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53 One further area of interest for this research group relates to those who observe simulations.
54 As noted earlier, due to large student cohorts and the pragmatics of providing simulations
55 within existing resources, students may be in the observer role for a substantial part of the
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3 time. While the learning potential in observing simulations is acknowledged (O'Regan,
4 Watterson, & Nestel, in press), many are now focusing on ways to maximise engagement for
5 these participants so they become agile observers may become more attuned to the
6 professional roles and responsibilities of the Registered Nurse. A critical component in
7 assisting students to make sense of simulation events for clinical practice is linking the
8 connections during the debriefing. The expertise of the debriefer and the debriefing approach
9 are important in this regard as students highly rated these components of simulation in the
10 context of making clinical judgements about patient care (authors, year).

17 **Overall discussion**

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19 The rapid uptake of simulation in the preparation of entry level practitioners is testament to
20 the powerful impact of this learner-centred approach to understanding practice. The journey
21 of becoming a healthcare practitioner is amplified after graduation as nurses begin to fully
22 contextualise their course experiences with episodes of patient care. The transformation from
23 novice to advanced beginner (Benner, 1984) requires clinical experiences that change the
24 student's capacity to act in complex situations. The aims are to shift the typical predominant
25 focus on skill formation towards noticing the salient features of situations and responding and
26 relating to patients and each other in meaningful ways. Students are required to learn skills of
27 perception and action and form what Merleau-Ponty (1969) called a style of comportment in
28 which they learn to adjust to the dynamics and possibilities of a particular situation. The
29 actions and responsibilities of being a nurse or a doctor form a habitus (Bourdieu, 1990) of
30 skills, expectations, perceptual acuity and nursing actions, which, over time, create the
31 foundation for skilled, embodied nursing and medical practice (Merleau-Ponty, 1969).

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43 Simulation presents an opportunity for students to begin to learn and develop a nursing
44 habitus or medical habitus, enabling them to rehearse the 'skilled know-how' required for
45 competent practice. The opportunity to experience and act in a range of complex clinical
46 situations through simulation enables healthcare students to rehearse and refine the skills and
47 holistic practices of their discipline. Simulation also facilitates the development of an
48 understanding of a clinical situation requiring specific responses and professional interactions
49 whilst fostering the growth of professional identity.

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Commonalities across the four case studies include the collaborative processes used to
develop and ratify scenarios through the engagement of educators with clinicians and

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3 consumers; and basing case studies on actual patient experiences. Simulation offers specific
4 opportunities for participants to develop or refine therapeutic and other communication skills
5 regardless of the scenario context and content. Experiential learning and learning by
6 experience underpins each of the case studies, as students are afforded opportunities to
7 become attuned to their professional roles through activities which closely align with practice.
8 Understanding what may be expected of them in the clinical setting and anticipating what
9 may happen next in patient 'situations' is highly valued by students and novice nurses (Kelly
10 et al., 2014). Ensuring simulation scenarios are informed by relevant pedagogical
11 frameworks ensures a solid foundation for learning experiences which have meaning and high
12 impact on subsequent practice and patient care.
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20 **Conclusion**

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22 Irrespective of the context or country, the case studies described in this paper reflect the
23 commitment of each author to enabling co-production of knowledge with students through
24 simulation by engaging with peers and consumers, and basing scenarios on authentic cases.
25 The importance of embedding relevant pedagogical frameworks into the planned simulation
26 experience and articulating with preparatory materials offers students opportunity to engage
27 in more meaningful ways in learning about their own and others practice.
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4 http://www.who.int/topics/mental_health/en/
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7 8 **Clinical Resources** 9

10 The Australian Society for Simulation in Healthcare

11 <http://www.simulationaustralasia.com/divisions/about-assh>
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14 The Society in Europe for Simulation Applied to Medicine <http://www.sesam-web.org/>
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17 The Association for Simulated Practice in Healthcare <http://www.aspih.org.uk/>
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19 The Society for Simulation in Healthcare <http://www.ssih.org/>
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21 Pat Deegan – Hearing voices curricula; Common Ground (recovery from mental health)

22 <https://www.patdeegan.com/>
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26 Keepwell Ltd – Arana Pearson, Director and Principal Trainer – Hearing Voices Program,

27 <http://www.zoominfo.com/p/Arana-Pearson/257833992>
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Figure 1. The didactic model of relation, modified after Hiim and Hippe (1998, p. 99).

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Table 1: Roles and scope of actions in the critical care trauma simulation

Participants	Actions and scope of role
MO (academic)	Guides the sim and unfolding events giving directions to rest of the team Students commence the simulation by themselves. You gauge when to enter the scenario
Patient voice Student 1 in control room	Patient responses / vocals; Responds to questions from MO and nurses. E.g. <i>Can't remember much about the crash</i> . Lucid but in pain (score 8/10). Sore everywhere. Feels better after morphine given. Groans & anxious when they roll you onto the side to check your back 1 minute after administration of the antibiotic, you start to <i>"feel funny"</i> ; <i>"it's hard to breathe"</i> . Stops talking when appropriate
Student 2 in control room	Observes and assists the sim technician (engineering student) with scenario progression/ clinical input to parameter changes etc. Answers phone if required - respond within context of conversation eg: <i>"blood results not available yet"</i> ; <i>"Potassium is ... other results pending"</i> <i>"blood cross match not completed yet"</i>
Triage nurse	Gives handover to the team then leaves (no more involvement)
RN1	Assigned as primary care giver for Mr Lucas Commence secondary survey Can delegate tasks and ask for help from other team members, TL and MO
RN2	Assists RN1 and MO with delegated tasks. Administers IV medications (morphine and antibiotic BOLUS IV PUSH) into left peripheral cannula; completes documentation as required
Team Leader (TL)	Deals with any issues of relatives, other patients Available for advice and support to RNs 1-2 and assists with any delegated tasks including liaison with other hospital departments; completes documentation as required
Wife / Sister or daughter (up to 2 roles)	Arrive 10 minutes into the sim. Wife very, very upset about the situation, sister trying to calm her down & make sense of what's happened. Provide information about the patient's health & social background to staff. (can ad lib with information but stay in role & don't overact)
Observers (all other students)	Watch the AV of the sim. Make notes about the team's performance and patient care. Would you do similar or different things?