

1 **Introduction**

2 A recent, very large, longitudinal study, indicated that up to 50% of clinical experience can be
3 safely substituted with simulated experiences (Hayden et al., 2014). This is good news for
4 clinical educators, particularly those with challenges to find quality clinical sites for the
5 numbers of students they educate. Yet, although simulation has become an almost ubiquitous
6 learning approach in healthcare education, multiple challenges exist, such as cost and how
7 best to develop scenarios that support student learning. Further, while educators are busy
8 planning, delivering and evaluating simulation activities relevant to their local health service's
9 and students' needs, with funding constraints and high teaching loads, it is increasingly
10 difficult for them to take time out to find out about innovative simulation practice that their
11 counterparts have created in other teaching settings.

12 The purpose of this paper is to provide summaries of diverse and novel simulation activities
13 designed to respond to challenges that educators around the world may relate to. The
14 challenges include: the artificiality of a manikin; succinct and confident handover of
15 information; shift work fatigue; communicating with colleagues from different disciplines;
16 effectively engaging the child-patient; nursing in a client's home; developing insight into the
17 personal experience of disability; and engaging learners using game technology.

18 **Getting past the plastic**

19 A common challenge in manikin-based simulation learning is ensuring students genuinely
20 engage with a patient who is quite clearly artificial, such as a case study or manikin (Barry et
21 al. 2012). To overcome this issue, educators converted paper-based case studies into
22 authentic online audio-visual (AV) vignettes as preparation for manikin-based simulations. An
23 audio-visual learning trigger has a number of advantages for learners. They engage multiple
24 senses, humanise the issue, and they can be stopped and replayed, which is useful for
25 reflection, shared problem-solving, and for those who may have language barriers that
26 require extra time for study (Verleur, Hevelman & Verhagen, 2011).

27 In the production of this simulation, academic staff played nurses and actors played the role
28 of patients from a range of diverse backgrounds and who were dealing with various health

29 challenges. Rather than simply read the case study, this activity allowed students to assess
30 the patient by observing, listening, and to notice differences, idiosyncrasies, cultural
31 vulnerabilities, stereotyping and unique responses to care. The video also gave opportunities
32 for students to observe the responses of the nurses, thus providing role modelling, and
33 demonstration of skills including clinical reasoning and actions. After meeting the patient via
34 this audio-visual experience, students then proceeded to meet the patient, now simulated by
35 a manikin in a face-face scenario. The environment was designed to replicate each video: for
36 example, the manikin was similarly dressed, or tattooed. In this way, the manikin had a 'back-
37 story' or biography, and the aim was that students would be better able to relate to the plastic
38 manikin in the bed and to engage with the manikin as if it were a patient.

39 An evaluation of the impact of this simulation experience identified that students drew strong
40 and immediate connections between the videos and the manikin-based simulations.
41 Students indicated they felt more invested in caring for the manikin, were more emotionally
42 engaged with the unfolding storyline, and more aware of judgemental attitudes and biases
43 (Power et al. 2016). Students also appreciated the opportunity to witness examples of what
44 nurses might say and do in certain situations and to use those examples in practice.

45 **Collaborative communication during handover**

46 Across the world, inter-professional and collaborative communication failures are responsible
47 for most health-service errors that erode patient safety and security (Baron, 2014; WHO,
48 2011). To improve collaborative communication during patient handover, the Simulated
49 Practice Activity (SPA) was created. The experience was designed to occur at the end of a
50 therapeutic communication course, and involved nursing students, service users, and service
51 partners such as practising nurses. All stakeholders were first prepared for the encounter in
52 a pre-briefing session. Then students in groups of 3 took on the role of evaluator, mentor, or
53 novice student. The student was asked to assess a patient, played by a service user, using the
54 service partner's hospital admission form. The student was then asked to provide a hand-over
55 to the service partner. The activity concluded with a guided reflection session where all
56 stakeholders could comment on the handover, its strengths and areas for improvement. The
57 activity provides students with much needed practice in communicating with patients, making
58 clinical assessments and handing over their decisions to a clinical peer.

59 **Night duty, fatigue and the need for information**

60 Another issue affecting nurses globally, and yet something that many students may not
61 understand fully because of restricted placement times, is the ravages of shift work. Han et al
62 (2014) recently showed that fatigue from shift work can hinder work performance and
63 threatens both nurse and patient safety. Therefore, a simulation activity was designed so
64 that students would be exposed to a series of video-recordings of bedside handovers from
65 tired night shift colleagues, and asked to discern from this inadequate handover the
66 comprehensive medical and nursing needs of the patient. The range of patient issues
67 simulated, and overlapping amongst patients, included dementia, asthma, post-operative
68 bowel resection and the repair of a fractured neck of femur.

69 This was a difficult task, which simulated the kind of situation many students were likely to
70 encounter in their near futures as graduates. The activity raised students' awareness of the
71 complexity of patients' needs within busy health-care environments and the responsibility
72 that nurses have in ensuring that all required information is handed-over even if the
73 circumstances are time-pressed and difficult.

74 **Learning to work with other health professionals**

75 Nursing students across the world tend to spend the majority of their study time in uni-
76 professional groups and as a result rarely get an opportunity to learn about the disciplines,
77 world views, and unique practices of other professional groups. This is considered detrimental
78 to the later expectation of inter-professional communication, empathy and respect (Gough,
79 2012; Hood et al 2014). To correct this concern, an inter-professional simulation-based
80 education (IPSE) activity was designed for nursing and paramedic students to build an
81 understanding of the components of a patient's healthcare journey from the perspective of
82 the patient, rather than the discipline.

83 Two patient experiences were explored. They involved the experience of sudden chest pain
84 and epileptic seizure. All students were briefed together and then each discipline facilitator
85 conducted a discipline briefing to ensure students were familiar with the equipment and
86 environment. The simulation began with the patient's experience of health deterioration. It

87 was followed by paramedic students responding to an emergency call, attending, treating and
88 transporting the patient, whilst being observed by the other nursing and paramedic students.
89 The patient was transported to a simulated emergency department, where the nursing
90 students received a handover, continued the patient assessment and patient's care, whilst
91 being observed by the other paramedic and nursing students.

92 This immersive simulation experience allowed students to gain a more comprehensive
93 understanding of each other's role in assessing and caring for patients, as well as to see a
94 health -care crisis through the perspective of a patient at home. Depending on level in course,
95 students were either allocated to observer, with the task of critiquing practice throughout the
96 activity, clinical lead, or clinical support. Reflective debriefing occurred following the activity,
97 and explored professional role identities, effectiveness of inter-professional communication,
98 and the health care journey from the patient's perspective. Evaluation revealed that students
99 found the activity relevant and raised awareness of differing professional approaches to
100 critical thinking and clinical decision making.

101 **Learning the art of communicating with children**

102 No matter where nurses practice in the world, the challenge of communicating effectively
103 with sick and injured children arises. Unlike adults, children may lack experience and the
104 cognitive capacity to fully understand the meaning of illness, diagnoses and treatment.
105 Similarly, they may not have the psychological and social abilities yet to compose and contain
106 emotions such as fear, distress or frustration (Bjorklund & Causey, 2017). Thus, nursing
107 students benefit from learning that focuses on communicating with children.

108 A simulation was designed, incorporating the use of a silicone procedural puppet. The aim
109 was to prepare students for undertaking vital signs with paediatric patients. The puppet has
110 been custom-designed and includes a movable face, an injectable abdomen, catheterisable
111 genitalia, a patent nose for naso-gastric insertion, intravenous access via the arm and a porta-
112 cath for injections (See Figure 1). One puppet can be used for around 25 students, and costs
113 7000 Australian dollars. Tubing exists throughout the inner workings of the puppet so that
114 fluid can be extracted or delivered, for example, simulating urination, or being able to insert
115 fluid into the porta cath. The puppet can simulate sternal recession and abdominal breathing.

116 It has a cartoonish appearance with larger head, engaging eyes and smaller body to make the
117 puppet friendly and engaging. Lastly, the puppet was made of silicone for ease of cleaning
118 and address infection control issues identified in previous studies when using cloth puppets
119 in the clinical environment (Author et al 2014).

120 {Insert Figure 1 about here}

121 A specific pedagogy has been developed and published on the use of puppets for health
122 professional learning. This approach requires the educator to transform the puppet into a
123 little person with a story and history relevant to the learning experience. The narrative then
124 becomes the platform for learning and teaching and the educator guides and facilitates the
125 learning through the character puppet (Author et al. 2017). Evaluation has shown that
126 learning in this way, students do not experience the detachment that has been reported to
127 commonly occur when students learn solely on manikins (Dean et al. 2017). Yet, importantly,
128 students learn how to simultaneously interact compassionately and even playfully, whilst
129 implementing a nursing procedure effectively.

130 **Learning to nurse in a person's home**

131 In many countries across the world, home-based nursing is just as prevalent as hospital-based
132 care, and students need practice with learning about the unique and challenging nature of
133 working in a person's home, where access to clinical supervision and clinical resources are
134 limited (Savarese, 2016). Students need to be familiarised with and oriented to this new
135 environment because, unlike in a hospital setting, students and nurses are guests in
136 someone's home and surrounding community and this requires a different dynamic for
137 communication and interventions. Skills in environmental and psychosocial assessment and
138 provision of safety require particular development (Unwin & Tatum, 2011).

139 Home visiting is one way that students connect with clients in a Population Health Nursing
140 (PHN) course. In a simulation of home-visiting, students participated groups of two in four
141 different home situations. Prior to the experience, students prepared by reading about
142 interviewing (Frankel & Stein, 1999), therapeutic strategies to meet and intervene with clients
143 in their homes (Unwin & Tatum, 2011), and guides for specific assessments, such as risk for

144 suicide and child/older adult abuse. A home setting was established in the simulation centre,
145 and standardised patients were used to enhance the realism. The four scenarios presented
146 students with health, social, and environmental challenges: (1) a new mom/newborn visit; (2)
147 an older adult female who was frequently calling emergency services for non-emergencies;
148 (3) a recently widowed male who was discharged from the hospital to home following an
149 exacerbation of heart failure; and (4) a middle-aged Type I diabetic woman, who could not
150 afford her medications and testing materials.

151 Although the simulations focused on individual clients, the debriefing widened the lens to
152 consider populations experiencing similar issues and community resources. Evaluation has
153 shown that students gained a new appreciation for the importance of environmental and
154 population-based issues that impact upon health-outcomes and confidence in conveying a
155 respectful stance to support client autonomy.

156 **Learning clinical skills peer to peer**

157 A challenge for large schools of nursing globally is the sheer number of students that need to
158 learn effectively in settings where time and resources are tight. Building on the idea that
159 learning can be effective even when students are observing, and critiquing, rather than
160 directly acting – a term Spouse (1998) describes as *legitimate peripheral participation*, a
161 simulation experience was designed to harness and potentiate the impact of peer learning.

162 Rather than the nursing educator directing activities, their role was restricted to facilitate peer
163 interaction. Students took responsibility for actively learning from each other through peer
164 observation, critical review and feedback discussion (Stone, Cooper & Cant, 2013).

165 Groups of up to 30 students working in teams of 4 to 5 worked through four different patient
166 scenarios. The scenarios were approximately 15-minute duration and took place in a
167 simulated ward with six SimMan manikins, that could simulate human physiological functions
168 when manipulated by a handheld SimPad system.

169 The SimPads were programmed so that each of the scenarios allowed numerous pathways or
170 stage tabs that varied in complexity. The person controlling the device chose a stage tab,
171 according to the student's clinical reasoning process upon encountering the clinical issue.

172 Each stage tab had pre-set human physiological functions, for example, the manikin might
173 deteriorate, die, or recover depending on the decisions made by the student. The student's
174 actions and decisions could also be recorded and timed in the SimPad program. Standard
175 recording activities in each SimPad scenario were listed on the right-hand side of screen and
176 included: hand hygiene, introduces self, effectively communicates, gains consent, comfort
177 measures, reassures patient, ISBAR handover framework, documents, team communication
178 and correct medication administration. The left-hand side of the screen predicted care
179 activities pertaining to that particular stage of scenario were listed.

180 Each scenario required 4 student roles: one person to operate the SimPad device, one to play
181 a doctor, one to provide the patient's voice and one to play the nurse. On completion of each
182 scenario the group debriefed with each other, asking: 1) What did you do well? 2) What did
183 you not do not so well? and, 3) What would you do differently next time? Evaluation has
184 shown that students found the peer learning to be as effective, and challenging as the
185 educator-led simulation experiences.

186 **Taking an empathic stance towards illness and disability**

187 Thanks to advances in health-care, more people world-wide are surviving serious injuries and
188 illnesses, yet this also means that many people are living long lives with disabilities that range
189 from physical to emotional (Vos et al., 2015). This requires that nurses move beyond the
190 medical model, towards the psycho-socio-cultural and spiritual so that they can support
191 clients and communities in ways that are functionally useful, but also emotionally empathic
192 and uplifting. In preparing for this shift in practice, students need to learn how to listen
193 empathically, and communicate to clients that they are trying to understand and work with
194 their unique needs and experiences (Anderson, Ford & Thorpe, 2011). Although empathy is
195 integral to practice, many health professionals have a limited understanding of the
196 experiences, needs, and preferences of people with disabilities and clients continue to
197 perceive discrimination from nurses and others (Flickinger et al. 2016).

198 To enhance students' empathy towards people with a disability, an immersive simulation
199 experience was devised. Participants were allocated the role of either a person with an
200 Acquired Brain Injury (ABI) or a rehabilitation nurse. The simulated patients wore hemiparesis

201 suits that replicated the experience an ABI, and they were provided with the following
202 information:

203 *You have recently been transferred to a rehabilitation unit after being in an acute care*
204 *hospital for three months. You have an acquired brain injury as a result of being involved*
205 *in a car accident three months ago. You have difficulty talking, difficulty swallowing,*
206 *blindness over half of your field of vision and paralysis to one side of the body.*

207 The students allocated the role of a rehabilitation nurse were given the following instructions:

208 *You have been allocated the care of a recently admitted patient with an ABI. Their long*
209 *term prognosis is uncertain, but your goal is to help them become as independent, self-*
210 *caring, and confident as possible. You will need to help the patient dress, take them for*
211 *a walk, and help them pour and drink a glass of thickened juice.*

212 Evaluation demonstrated that students' empathy levels improved and students' stigmatising
213 beliefs were challenges and replaced. When the students assumed the role of the patient
214 during the simulation they gained new understanding of the personal experience of ABI.

215 **Game-based simulation learning**

216 The digital revolution is not only changing the way health-care and education are delivered,
217 but it is transforming the very nature of social interaction, including the ways students learn
218 (Mawhirter & Garafalo, 2016). The use of gaming technology, where a player solves a puzzle,
219 advances to higher levels or wins rewards engages learners, building their interest in the
220 subject matter, and personal self-efficacy (Sung, Hwang & Yen, 2015).

221 A game-based simulation was designed to teach nursing students environmental health and
222 safety assessment. In this game, learners were introduced to clients who live in a variety of
223 contexts, including a cottage, long term care, community park and supermarket car-park.
224 Immersed in a 3D virtual environment, learners' curiosity and sense of adventure were
225 sparked as they enter and move around dwellings, open doors, switch on lights and assess for
226 potential and actual hazards. Over a hundred different hazards were randomly generated
227 each time the learner entered a level in the game. Using drop down boxes, they identified
228 and categorised hazards and selected interventions that contain, minimise and eliminate
229 health and safety risks. This promoted learners' critical thinking and clinical reasoning skills
230 and a practical opportunity to apply theoretical concepts and practice undertaking skills that

231 are not often available to them in clinical environments. At the completion of the game,
232 detailed analytics and individual feedback provided learners with information about the
233 number of hazards found, correctly categorised and managed. Evaluation has shown that
234 students improved their detection and management of health risks and that the game
235 technology is accessible, cost effective and engaging.

236 **Summary**

237 Over the last decade, the use of simulation has matured, and educators are increasingly
238 utilising creative and pragmatic solutions to address contemporary practice and educational
239 issues. As has been detailed in this paper, simulation learning can introduce students to
240 technical as well as non-technical skills required for competent nursing practice. The paper
241 covered strategies to enhance realism within simulation to enhance learner engagement –
242 audio-visual enhancement of case studies, child-like puppets, and body suits that simulate
243 the restricted movements experienced by a patient with acquired brain injury are examples.
244 The paper also covered activities to build confidence and accuracy in the processes of client
245 assessment, clinical handover and collaborative communication.

246

247 Because nursing and health care are increasingly taking place beyond hospital borders it is
248 imperative that students learn to use a wider lens in their assessment of clients, families and
249 communities – beyond physiology. The paper explored home-based simulation, and a game
250 to promote awareness of environmental hazards. In providing this series of snapshots from
251 across the world, it is hoped that educators everywhere will be inspired to incorporate and
252 adapt these activities to continually improve the quality of simulation learning experiences.

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