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# Churchouse, C. and Rudd, C., Edith Cowan University, Australia Bridging the Theory to Practice Gap Using Performance Based Simulation

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## ABSTRACT

“Simulation is a technique, not a technology, to replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion.” (Gaba, 2004).

There has been a growing acceptance on the use of simulation in teaching cardiopulmonary resuscitation (CPR), cardiology skills, anaesthesia skills, and crisis management largely focusing on responding to physiological events. However its use in other health and education arenas is less common due to their complexity of characterisation. There are a number of reasons for this:

- Complex performance based scenarios can be difficult to develop and to simulate.
- Performance based scenarios using standardized patient/actors seldom fit neatly into the ‘textbook genre’.
- There are not always defined algorithms for managing scenarios that are not based on a physiological event, such as CPR

The use of simulation is transferable to many education disciplines, enabling the learners to immerse themselves into a simulated situation in a safe and controlled learning environment.

Using a case study approach based of a Western Australian Coroners Case Investigating the death of a patient, this paper will show case elements of the simulation as it was presented, focusing on the simulation development process, including difficulties, outcomes and lessons learnt. It will discuss the methodologies for developing learning opportunities using trained actors and standardised patients, enabling the student to expand their learning in a safe and controlled environment where they are able to develop competency in areas such as communication, leadership, team work, conflict management and facilitation, not just the technical skill.

**Keywords:** Simulation, Theory to practice gap, Standardised patients

## INTRODUCTION

“Simulation is a technique, not a technology, to replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion” (Gaba,2004).

There has been a growing acceptance on the use of simulation in teaching health care professionals especially in the area of cardiopulmonary resuscitation (CPR), cardiology skills and anaesthesia skills. Simulation is also a technique being used in some corporate and professional groups for teaching crisis

management, communication, human resource management and leadership. However its use in other health and education arenas is less common due to its complexity of characterisation. There are a number of reasons for this.

- Complex performance based scenarios can be difficult to develop and to simulate.
- Performance based scenarios using standardized patient/actors seldom fit neatly into the ‘textbook genre’.
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The use of simulation is transferable to many education disciplines, enabling the learners to immerse themselves into a simulated situation in a safe and controlled learning environment.

Using a case study approach based of a Western Australian coroners case investigating the death of a patient in custody, this paper will show case elements of the simulation as it was presented, focusing on the simulation development process, including difficulties, outcomes and lessons learnt. It will discuss the methodologies for developing learning opportunities using trained actors, enabling the student to expand their learning in a safe and controlled environment where they are able to develop competency in areas such as communication, leadership, team work, and conflict management.

The challenge for all educators is to deliver course content and learning environments that provide students with the knowledge, skills and attitudes to make a seamless transition from the classroom to the work environment. This paper provides the case for the use of scenario based learning in education and offers strategies to enhance the validity and impact of the simulated performances. A case study using this approach is described. Our contention is that using scenario based learning in rich complex scenarios within undergraduate, graduate and industry-specific, education can bridge the theory – practice gap.

## LITERATURE REVIEW

Scenario-based training has been heralded as an approach to learning that enables students or participants to “practice performing tasks in a realistic simulation of the operational environment, [and to] receive exposure to a variety of nominal and unusual situations” (Mohammed, Ong, & Li, 2005).

Various definitions have been provided for what simulation is

Simulation is the “artificial representation of a real-world process to achieve educational goals via experiential learning” (Seropian, 2003).

“Simulation allows personnel to practice and learn principles in a controlled environment that will better prepare them for the safe administration of health care to patients” (Saunders, 1997).

“Simulations allow learners to explore how key variables interact and affect performance” (Gaba, 2004).

“Simulation is a technique, not a technology, to replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion” (Gaba, 2004).

Simulation includes the use of several technologies, including part-task training devices (e.g. Intravenous insertion arms in health), sophisticated mannequins, interactive software programs and

simulated actors. How many of these modalities and how they are used is only limited by the imagination of the trainer or examiner.

For this paper we will focus on the use of simulation techniques, particularly simulated actors to create realistic scenarios for teaching purposes.

Simulation based training has been used extensively for aviation (Jentsch, & Bowers, 1998), security (both National security and IT security), military (Lynch, 2005), teaching (Kilpiö, , Laine, & Markkula, 2005) and business (Saunders, 1997). Additionally, simulation has been used by a range of health disciplines and for a broad range of teaching and examining purposes including anaesthetics, trauma management and emergency medicine. Simulation is used to teach not only for technical skills but also cognitive and communication skills such as team work and cultural awareness (Crowshoe, Bickford & Decottignies, 2005).

## **SIMULATION AND LEARNING THEORY**

Constructivism is a learning theory that postulates “that students learn best by engaging in authentic learning tasks, by asking questions and drawing on past experiences” (Carlson,2001). Thus, an effective learning experience can be considered as one that puts the students in control and encourages active participation, exploration, reflection and the individual construction of meaning. Galarneau (2005) asserts “there is a huge disconnection between knowing something in abstract and being able to make that knowledge actionable” and quotes Siemens explanation of it being about “forming connections between islands of knowledge”. Allmark (1995) proposed that in fact knowledge of practice is different from theory and cannot be reduced to it. This is exemplified in the many work environments where the experience of the individual cannot be simply reduced to a list of knowledge and skills requirements but requires the addition of adaptability; the art of juggling situational and interpersonal dynamics.

Simulation can provide students with an active learning experience closely modelled on real situations that creates a bridge between the theory and practice (Gaba, 2004). It has been proposed that simulation is supported by an educational philosophy of blended and multiple learning solutions in which change and experimentation are valued and the lines between training, performance improvement and organisational development are blurred (Kindley, 2002).

Simulation is learner-centred rather than person centred. With “real” people the “fit” of the learning experience to the trainee’s level and needs is suboptimal. In simulation based training, trainees receive controlled exposure to a range of designated, pre-designed encounters. This is consistent with adult learning where trainees learn at different paces and in different styles (Ziv, Small, & Wolpe, 2000).

Through simulation learners benefit from repeated exposure to a range of scenarios that encourage them to flex their capabilities. In the process they also learn to be more flexible, handle greater ambiguity, manage resources and solve problems (Galarneau, 2005). Satish and Strenfert (2002) refer to the need for clinicians to gain “intellectual processing skills” to regulate his or her own processes of attending, learning, remembering and thinking, involving both external information as well as remembering information and concepts. The intellectual processing skills must be adjusted to changes in task challenges or dynamics (including volatility, uncertainty, complexity, ambiguity and delayed feedback) and must be adjusted to gains in knowledge over time.

Being able to put theory into practice is not all that is required. Tynjälä (cited in Kilpiö et al., 2005) discuss simulation based training as *socialization into professional culture*. The essential objective is to actively participate in authentic work practices and to familiarize themselves with the thinking and behaviour of experts. Lynch (2005) describes scenario-based training when used to train law enforcement officers, as an amalgamation of knowledge and skills-based training that incorporates psychomotor coordination and reinforces a survival mind-set in the student.

Gaba et al. (2001) relate the complexity and dynamism of clinical areas, such as anaesthesiology to other industries such as commercial aviation. Cockpit crews undertake highly realistic simulation scenarios requiring complex decision making and interaction with multiple personnel. Scenarios are followed by a detailed debriefing using videotapes of the simulation session. This approach has been extended to a wide variety of other education domains that involve complexity and dynamism. The training philosophy adapted to health care is one of training single-discipline crews to work in teams. The authors assert that simulation-based training that emphasises decision-making and teamwork principles will become commonplace in all settings in the coming decade. In Australia, Flanagan et al. (2004) have used simulation using life-size patient mannequins to address the theory-practice gap to “explore the human, or behavioural, aspect of clinical intervention” in a crisis situation.

Failure in simulation training is a critical component of learning (Shank, cited in Galarneau, 2005). Simulation can reduce error and instil a culture of safety (Fried, Satava, Weghorst, 2004) and provides a means for exploring vulnerabilities and for using that information to improve the competence of providers, the system and the interaction between the two (Ziv, Wolpe, Small, & Glick, 2003). This is an important advantage simulation has over apprenticeship learning models where failure in practice has serious quality and safety implications.

### **WHY USE PROFESSIONAL ACTORS IN SIMULATION?**

“Acting is the study and communication of human behaviour in service of telling stories. The best actors are experts on the human condition. They are experts in using their bodies and voices to communicate all kinds of human struggles. They are expert storytellers. There is an infinite amount to learn about acting because there is an infinite amount to learn about life” (Bennett, 2007).

Art is increasingly used in educational settings around the world especially when development of complex communicative skills and abilities is targeted. In health education there has been a growing awareness of the value of the use of actors in educational drama. To discuss a patient in a consultation is clearly unethical in real life because of the need to protect the dignity of the patient.

An actor is less vulnerable because of their professional handling of the role (Jacobsen, Baerheim, Lepp, Schei, 2006). As specialists in this field it is believed that a vital ingredient of successful role-play is the use of professional actors. Actors bring realism to what can otherwise be an artificial situation. They are totally believable which draws out authentic behaviour from participants and encourages input from observers. Only by using professional actors can the character’s tone, demeanour and attitude be finely tuned according to requirements (“Role play is a powerful method of selecting, training and retaining the right staff”, n.d.).

Trained actors know how to take their own experiences and draw from them to create a real person who matches the role play scenario, but with significantly more depth and breadth. This comes from the actor’s ability to create a real character using his or her own real experiences and real emotions. Actors are trained to tap their inner resources to create a character that is different from them, yet genuine. Along with the capability of improvising within the defined parameters of the role play, they engage participants so that the self-conscious artificial behaviours we often see in role plays are replaced by involved, genuine behaviours by the participant. They can provide credible information based on their own experiences and preparation or can quickly change the focus of the situation from the unknown facts to something more relevant. A trained actor can push a participant enough to force real involvement and real reactions without damaging the participant’s self esteem and motivation to continue skill improvement.

Using professional actors to enhance nursing skills development provides students with clinical competence sooner in a cost effective and efficient way. Students are also practicing interviewing skills, communication, assessment and problem solving skills (Kerr, ND).

Reliability and validity of the actors' performance is also important. Reliability relates to the consistency of the performance. This is particularly important when actors are used for assessment as inconsistent performance introduces variation into the examination process and biases the outcome scores (Ladshewsky, 1999). Validity refers to the how closely the performance resemble a "real" behaviour and affect. The validity of the actors' performance has been demonstrated through studies where it was identified that students' performance was not significantly different in a real situation as opposed to an actor based simulation (Ladshewsky, 1999, Wallace et al. 2002). In other words student reacted to the actors as they would to a "real" patient. Tamblyn (cited in Ladshewsky, 1999) measured the accuracy of simulated patient actors, by recording the proportion of essential clinical features presented correctly by the simulated patient. Accuracy ranged between 90-94% but some cases had scores of less than 80%. Accuracy appeared to be worse for physical examination findings and portrayals of patient effect. One third of these errors, however, were systematic suggesting they could be eliminated through training.

Training is the most significant factor influencing reliability and validity of performance. Unfortunately, few studies scrutinise the validity and reliability of the standardised patient actors they use or detail the training times for standardised patient actors (Ladshewsky, 1999). There is also little in the literature on the benchmark standards to which the simulators are trained (Wallace et al. 2002). Wind et al. (2004) developed the Maastricht Assessment of Simulated Patients (MaSP) an instrument to assess the performance of simulated patients. Seropian (2003) also emphasises the importance of creating the illusion of reality and paying attention to the details in designing simulations. He compares this with the movie industry where the director must construct complex sets with authentic props for the audience to perceive the situation to be "real" and to suspend their disbelief to relate to the characters.

## **CASE STUDY**

An example of actor based simulation to facilitate learning was undertaken at an Australian university in April 2008. This simulation was based on a coroners' case of a death in custody from a regional Hospital.

The aim of this simulation was for the participants observing to

- Identify key non clinical events that led to the outcome of death in custody
- Discuss leadership strategies that could be implemented to prevent this scenario from occurring in the future
- Outline management strategies that could be implemented at a hospital level to prevent this scenario from occurring in the future

In summary the case involved a young man who had been involved in a serious motor vehicle accident roll over. He was an uncooperative, verbally and physically abusive young man who was admitted to the emergency department (ED) for assessment and management. He was discharged into police custody after being in the ED department for approximately 70 minutes without being examined. He died in custody and a post mortem investigation revealed multiple injuries including chest injuries, abrasions and a fractured pelvis with a ruptured femoral artery.

When developing an educational scenario using actors it is also important that the educator considers everyone that may be involved even though they all won't be in the simulation. Write the character's role outline. Use as much detail as you can. (An actor needs a detailed character study to create a complete live character for an enhanced role-play). The more you give an actor to work with, the more exciting and real your scenario will be. In giving the actors the history that has surrounded the scenario, it is important that the facilitator outlines all the emotional, physical, situational and psychological issues that have led up to the current time. From this information, the actor is able to

develop all dimensions of the character. It is also important to always write the character in the present tense, it gives the scenario dramatic immediacy.

In creating our scenario, this information included briefs such as

**Nurse 1:** The nurse appears tired, she is having problems with her husband and son at home and has worked nine night shifts in a row. She knows this patient as he has been to the hospital many times following drunken brawls and is always in trouble with the law. She also knows that the patient has got his 16yr old girlfriend pregnant. During her assessment and provision of care, she does not acknowledge the patient or advise the patient of what she is doing as she takes his observations. Recounting the accident and her actions at the roadside to Nurse 2 she continually offers her personal viewpoint and with opinion e.g. the patient was drunk, he stole the car; smashed the car up; he is known to us; always in trouble around town; and she tells everyone that the patient “hit her in the ambulance”.

When a doctor asks if she needs any help, she states “No you need to see the other patient as he is more urgent”. Nurse 1 does not think to ask for assistance with the patient, she is not communicating with the team as she thinks the team are not competent to do the job as well as she can. She does not instruct other workers in what she needs them to do to help her or the patient

The challenges faced in preparing the actors for this simulation were multifaceted. The key issue in facilitating any performance based simulation is that the actors must be made aware of the learning outcomes to be achieved by the participants so they ensure that the performance supports the outcomes. It was also important to ensure that each actor has a ‘whole’ character so they are able to perform at all levels of human interaction. Benedetti (1986) states that “character is the material from which plots are created, for incidents are developed mainly through the speech and behaviour of dramatic personages. Characterisation is the playwright’s means of differentiating one dramatic personage from another.” (pg. 238).

This was an observational simulation where 80 senior health nursing practitioners observed the simulation and then undertook a facilitated learning program to identify and implement mechanisms to address the issues identified around leadership, communication and team work. Part of the learning and application of knowledge to practice involved the participants having the opportunity to interview the actors, in character, to establish factors that had motivated or impacted their behaviour in the scenario. Following these discussions the actors then replayed the simulation, applying the strategies that the participants had discussed for implementation.

Participant feedback from this simulation identified that

- 93% of participants found the session clearly identified key events and issues that led to the death in custody of the patient;
- 97% of participants reported that simulation was an effective learning tool that enabled nursing leaders to identify leadership strategies that could be implemented to prevent this scenario from occurring again; and
- 90% of participants reported that the opportunity for group discussion assisted with the identifying management strategies that could be implemented at hospital level to prevent reoccurrence of the situation.

## WHAT ISSUES DOES USING ACTORS FOR EDUCATION SIMULATION RAISE?

Hodges (cited in Wallace et al. 2002) have reported short term impacts on actors, including difficulties emerging from the characters, sleep disturbances and heightened levels of anger, anxiety and sadness. Rubin and Philip (1998) have found that actors' perceptions of their own health care were significantly worse one year after their involvement in an Objective Structured Clinical Examination. Bokken et al. (2006) reported that emotional roles are more likely to give rise to negative effects (e.g. exhaustion) than other roles although these were mild and of short duration. Debriefing with actors and participant must therefore be part of any course.

## CONCLUSION

The use of simulation in education has a strong place in learning curriculums, be it for teachers, health care workers, or administrators. What is important is that the educator or facilitator is skilled to develop and apply these learning principles to their teaching modalities. Providing extensive training for actors and facilitators for education simulation helps to provides realistic learning environments and assists to prepare a workforce with the flexibility to function in the real environment.

The lessons learned from this application of the theoretical principles to practice in this case study were that:

- This is a valuable tool for presenting simulation learning
- It was an effective strategy for achieving learning outcomes;
- It is very important to prepare the actors by developing and character motivations, social, emotional and moral essence
- Actors and participants must be debriefed at the conclusion of the simulation to ensure no emotional or psychological harm
- The value of reflection and debrief to support learning and consolidation of knowledge form theory to practice.

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