

CHAPTER C5

The Edge of Reality: Challenges facing educators using simulation to supplement students' lived experience

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Abstract

Employing simulation to help students acquire a specific skill or get closer to a particular issue or problem in order to understand applications to the real world is hardly new. The Ancient Greeks employed descriptive scenarios to convey their social, ethical and moral positioning in society. Today simulation-based learning is used to supplement students' work-based experiences and to integrate traditional knowledge with experience gained in the actual professional setting. Simulation has gained particular recent momentum in the health/medical area as a way to bridge the gap between theory and clinical practice. Simulation is gaining ground as a medium to deliver a whole range of core skills to aspiring graduates.

Despite a growing popularity, there is an apparent absence of discussion in the literature of the respective roles and prerequisite knowledge of the human agents involved in any simulation-based learning process. The result is an 'objectified' perception of simulation: 'simply light the blue touch paper and the learning outcomes will be achieved'. What we do know is that educator(s) and students will together determine the success or otherwise of simulation-based learning.

This chapter aims to reposition educators and students back into the centre of the simulation learning process. Their involvement as unique individuals will generate sets of challenges likely to influence simulation success, namely: learner-focussed, educator-focussed, situation-focussed, and curriculum focussed challenges respectively. The chapter ends with a summary of the ways educators might deal with inherent challenges confronting the use of simulation in healthcare settings.

Introduction

The use of simulation to help students acquire a specific skill or get closer to a particular issue or problem in order to understand applications to the real world is hardly new. It has historical roots in gaming that date back as far as 3000 BC to a Chinese war game called Wei-Chi, the game of encirclement (Hsu, 1989; Betts et al,2009). Today, groups of military meet to discuss and execute simulated tactics in buildings specific to that particular purpose¹. Simulation has also been used for centuries in the form of scenario planning – a skill which, according to Van der Heijden (2002), we all demonstrate in our day-to-day decision-making.

The ‘nothing new’ tag becomes apparent when we recognise the familiar learning designs subsumed beneath the term ‘simulation’. These include: role-play; scenario-based learning; gaming; psychodrama; sociodrama; playback theatre; and, dramatization/re-enactment. All of these learning designs are based on ‘situated learning theory’ (see Brown, Collins & Duguid, 1989). Each design has its own provenance and affords participants an active part in exploring roles, responsibilities, beliefs, values, interpersonal relationships, procedures, and norms as prospective members of a particular professional/ societal group.

Gaba (2004:1) defines simulation as “a technique used to replace or amplify real experience with guided experiences, often immersive in nature that evoke or replicate substantial aspects of the real world in a fully interactive manner”.. Simulation can, with appropriate guidance, enable students to acquire professional skills, pursue genuine problems, explore authentic issues, and deliberate on significant matters concerning the profession and their prospective place within it.

Simulation has achieved a high degree of sophistication in aviation and can be traced to the use of flight simulation on the ground in WWII to train fighter pilots. Through employing simulations, the aviation industry learned that crew resource management was important to understanding and correcting the miscommunications, and that a lack of crew coordination led to aviation accidents (Gaba 2004). Sophisticated and well developed training programmes can be used to challenge even the most experienced individuals and teams.

Civil aviations, NASA and nuclear power stations continue to be prominent users of simulators for training and performance evaluations, (Larew et al,2006). Simulations are used not only designed to build effective collaboration in teams but also to develop and test individual skills of pilots, astronauts, and others where a culture of safety is paramount (Gaba, 2004).

Within higher education, simulation has made recent inroads into the preparation of graduates for the professions particularly in social science, health and medicine, and business and management disciplines, (Issenberg and Scalese 2008; Errington 2010). Given the growing popularity of simulation-based learning in the health area, much of the focus of this chapter is on the efficacy and challenges of using simulation-based learning to prepare health professionals. As eventual graduates, this cohort will be working in a dangerous, high risk area: ‘Dangerous and high risk’ in the sense that their decisions will invariably influence the mortality of future patients.

Simulations are sited in a range of high-risk environments - for example in war games and training exercises for military personnel. In civil domains, simulations are used to teach skills to manage critical incidents, and natural disasters (Aitken, 2010). A common purpose lies in using simulation to expose participants to the kinds of risks and stresses likely to be encountered in the actual setting where reaction times to these events might constitute matters of life or death.

Simulation is being taken seriously by educators in the health area to a degree seemingly unmatched elsewhere in higher education settings. What appears lacking in the literature however is any discussion or analysis of the role of the human agents charged with the planning and evaluation of simulated learning. It is these human agents - educators and students - who will invariably influence the challenges facing simulation success.

Given the above, this chapter is divided into two parts: The first part highlights reasons why some educators use simulation to prepare graduates for the health professions. The second focuses on four significant sets of challenges facing educators using simulation and how these might be met. The chapter concludes with a

summary of the ways educators might deal with inherent challenges confronting the use of simulation in healthcare settings.

Why some health educators use simulation-based learning

One overriding purpose for using simulation in the health arena is to improve the education and training of students as would-be physicians, nurses and clinicians. Health education according to Gaba (2004:1), "emphasises conceptual knowledge, basic skills, and an introduction to the actual work" .. It is an education aimed at:

(a) Improving patient safety and care

It is no longer acceptable for students to practice some of the more invasive skills on real patients or surrogate animals. There are important ethical questions about using real patients as training resources (Issenberg and Scalese, 2008).

Instead, students can practice on virtual patients/mannequins (referred to as "simulators") long before they meet real patients (Gaba, 2004). Failure with the mannequin (or its equivalent) will not lead to real patient mortality - allowing the student and (future) patient to "experience a realistic situation without real-world risks" (Larew et al 2006:1). Mistakes in patient diagnosis for instance can become learning opportunities, (Broussard 2009).

Simulators interact appropriately with the actions taken by the simulation participant (Gaba 2004). The most recent simulators are anatomically lifelike with "detectable blood pressure points, pupils that respond to light, heart and bowel sounds, breathing lungs and chests that flail. They can cry, urinate, bleed, respond to chest compressions, suffer a collapsed lung, have a seizure, develop drug allergies, and give birth to an infant simulator," (Voelker, 2009:1). On the face of it, the most lifelike representations of patients should be the easiest for students to interact with; however their flexibility is in doubt as mannequins are often created for a specific purpose.

Not all simulators are devices: Trained actors and/or community volunteers, labelled 'standardized patients' participate in role-playing with students on matters of communication/clinical skills and diagnosis. They can enact a range of patient 'personalities'/interactions including aggressiveness, shyness, and other barriers to communication to help broaden students' range of responses.

The degree to which students feel able to interact with these various devices/people will determine their ability to link simulated experiences with real experience. As will be noted later, having lifelike simulated patients can be a problematic challenge for some students.

Simulations can provide an important introduction to the culture of patient care and safety and the respective roles of medical team members.

(b) Relating theory and clinical practice

Simulation-based learning is often used as a teaching strategy to deliver and then assess the practical application and integration of students' acquired knowledge (Harden & Cairncross, 1980). For example, health education students are given the medical details of a fictitious patient and are then required to act on this information in a professional manner, and solve one or more dilemmas, demonstrate 'appropriate' (professional/vocational) skills, and/or explore issues that have an impact on their work, (Gammer 2003; Van Wissen 2003).

(c) Developing a range of core skills

Simulations in the health arena are designed to deliver a range of essential skills (Broussard 2009). Students can practice skills, abilities and procedures until mastered; their eventual mastery is likely to boost personal and professional confidence in their application.

Examples of core skills include the technical, psychomotor and affective (Broussard 2009). However, as will be noted later, the pursuit of skills acquisition might well serve to underestimate the value of using simulation in the health area.

(d) Exposing students to the range of medical experiences

The more incidents students are exposed to, the more flexible and confident they are likely to become in dealing with problems and issues encountered in real settings. Simulation can present more examples of health/medical cases/issues than any one prospective physician might encounter in a lifetime. Simulations can incorporate also incidents that are uncommon or rare (Gaba, 2004). They might also include incidents that are difficult to access, for instance, those sited in 'dangerous' places such as a post-cyclone/tsunami situations.

(e) Dealing immediately with problems, issues and/or speculative events

Faced with problematic circumstances, issues, and/or speculative possibilities, the learner's task within any simulation is to "deal with the repercussions of the precipitating and related events efficiently", (Naidu, 2010:5). Just how (and why) students, as potential professionals in higher education deal with the simulated situations will determine what they manage to learn. Immersion, decision-making, problem-solving, and risk-taking are features of an on-going simulated learning process. They are designed to have participants respond to deal with circumstances, assess and evaluate experiences, and develop an internalised commentary on (professional & personal) processes.

(f) Reproducing practice

Simulations may be practised many times over until the requisite skills have been acquired. In order to 'stretch' students, the circumstances, players, tasks and potential 'solutions' may be skilfully manipulated by educators to achieve specific learning purposes. Information may be added or subtracted to render tasks easier or more difficult. In reality, we rarely have all the information at our fingertips and particularly so in difficult/emergency situations. Real life can be messy, ill-defined, and subject to change. We need sufficient information to elicit a response while at the same time, not having too much information that might swamp us.

(g) Enabling practitioners to learn about working in multidisciplinary teams

As professionals in the health area move toward working in specialist teams, either intra- or inter-professionally, it is important for students to engage in team experiences via staged simulations. In the health area, this is a particular issue as potential physicians and nurses historically receive separate training (even in common areas such as 'communication skills'). Only now are members of health faculties beginning to look at creating common course streams so that health education students have opportunities to work together - to experience team work and to gain *inter-positional knowledge*. That is, an awareness and subsequent appreciation of team members from other areas of health. Team-based simulations often focus on the importance of taking on a role and communicating these in an emergency (Gum 2010).

University medical schools might have some way to go in matching the provision of team skills with greater opportunities for group assessment tasks that attract the kind of credit given to traditional, individual-focused examinations.

(h) Providing situations for critical reflection

Within a simulation process, students are ideally afforded opportunities to "critically analyse their actions or their failure to act, to reflect on their technical, psychomotor and affective skills, and to critique the clinical decisions of others" as part of a de-briefing process (Broussard, 2009:2). The focus is on process rather than outcome. Engaging in critical reflection, students have opportunities to develop the meta-cognitive abilities and reflective dispositions of learners: Encouragement to 'step outside' of the simulation - to analyse experience as an observer as well as an actor is an important educational feature of any simulation process. The 'outer view' afforded by the process allows for a degree of detachment . Within this reflective learning process, students share experiences as a team member, as an individual, and as an observer of other peer experiences. By gently interrogating simulated experiences, generating hypotheses about their experience, linking observations/ deductions with previous knowledge, deliberating on thought processes, and connecting simulation to lived experience, students stand in a good stead to develop trains of thought vital to their development as professionals and reflective practitioners (regardless of the discipline).

In these essentially social settings, “participant experiences turn into learning” (Gum et al, 2011:3). Bleakley refers to this kind of reflection as ‘team’s conversational remembering, where learning occurs through social interaction

(i) Developing capability in real-time critical reasoning

Unlike life, simulations can compress one day's real events into a one hour simulation and variables extraneous to the learning focus may be removed. This ability to control events gives educators an enormous advantage in helping students focus on particular issues, problems and speculative events. Students can immerse themselves in the scenario circumstances, make decisions, take action, and reflect upon both at real-life speed. Feedback is often immediate, ideally objective and transparent so that the results of actions can be reflected on. The simulation and integrated opportunities for reflection can be used to develop real-time critical reasoning, particularly if simulations are sited in the here-and-now of the student's lived world. The more simulations students experience, the more decisions they are likely to have to make, the more likely it is that they will get better at thinking on their feet - and meeting the unexpected with curiosity rather than fear.

Significant challenges and how these might be met

Given the reasons why some educators use simulation, what then are the challenges they are likely to face while attempting to put learning intentions into practice?

As mentioned earlier, there is a paucity in the literature regarding the significant parts played by the human agents involved in a simulation-based learning process.

The chapter focuses on four identifiable sets of “human” challenges likely to impact on simulation initiatives. These are learner-focussed; educator-focussed; situation-focussed (inclusive of teamwork); and curriculum focussed challenges respectively.

A. Learner-focussed challenges

If these challenges are not met then simulation is most unlikely to facilitate educational intentions.

a) Psychological fidelity/realism

For simulation to work, it must induce psychological fidelity defined by Issenberg and Scalese (2008:33) as, “the degree to which the trainee perceives the simulation to be a believable surrogate for the trained tasks”..

Perceptions of realism will govern the degree to which students willingly suspend their disbelief in the fictitious roles and circumstances they face. They must accept the simulation as if it were real, and then act in accord with other players in the shared fiction.

Realism may be magnified by developing simulations that replicate the procedures, tasks and demands of the real process. Students have an opportunity to understand real health/medical procedures designed to improve patient care and safety and the respective roles of medical practitioners and allied health workers in order to minimise medical error.

However, as Li (2007:1) points out, “the learner may not participate in the situation nor take it seriously” for a whole variety of unrelated reasons. It is important for educators to communicate with students to find out what these “other reasons” are.

b) Clear understanding of the aims/purposes of the simulation

It is important the educators express clearly the purposes of the simulation, its scope, and the realistic roles to be assumed by participants in the simulation experience. Communicating to students the aims, purposes, processes and intended outcomes of the simulation would also seem to be at the heart of achieving psychological realism.

c) Productive interaction with simulated patients -simulators

Students are likely to encounter a whole range of simulated patients, or simulators, designed to look and react as authentic as possible for educational purposes. These “range from static anatomic models and single task

trainers to dynamic computer-based systems that can respond to user actions; from individual trainers for a single user to interactive role-playing scenarios involving groups of people; and from relatively low tech standardized patient (SP) encounters to high-tech virtual reality surgical simulators, “(Issenberg and Scalese, 2008:33).

The more sophisticated the simulated patient, the more likely they will match with students' realities. However, according to one student, the realism may not equate with a student's ability to relate to them as the realism can generate a comedic response.

Li (2007:1) notes that “it is difficult to replicate all aspects of physiological and clinical responses in a given situation”, and “because the situation is not real, it is difficult to replicate the same communication and emotional response that would be seen in the actual clinical setting”.. The lack of the (artificial) simulators' ability to express feelings and an inability to respond to student communication could well obstruct any suspension of disbelief in the eyes of the would-be physicians.

d) Opportunities for staged critical reflection

Within a simulation process, students are ideally afforded opportunities to “critically analyse their actions or their failure to act, to reflect on their technical, psychomotor and affective skills, and to critique the clinical decisions of others” (Broussard, 2009:2).

By necessity, simulations afford a high degree of interpersonal interaction where “the active nature of this type of learning allows participants to build on prior knowledge, relate the simulation scenario to real clinical problems and further develop their critical thinking skills,” (Broussard 2009:1).

To be educationally effective, critical reflection given by educator and student peers needs to be staged at appropriate points along a simulation learning dimension. ‘Appropriateness’ is determined by the emergent revelations of the simulation and the expressed knowledge of the participants.

Mercer et al (2010:2) notes that, for de-briefing/reflection to work, “the de-briefer needs to guide the reflective process without being too critical or judgmental of individual or team performances. He or she must aim to ‘tease out’ the salient human factor points in the order they arose during the scenario”.

B. Situation-focussed challenges

These challenges focus on the shared context of the simulations and the respective parts of educators and students in influencing the success or failure of learning processes: If these challenges are not met then the simulation will not be shared and the experience will be relegated to a discussion-only approach.

a) Establishing near-life situations

If they are to work, simulations need to represent near-life incidents: Ones that have a shared believability/reality so that students feel able to suspend their disbelief in a peer supported situation. The closer the circumstances comprising the simulation are to students' own reality, the more likely they will abide by the fiction. However, it is also important that students' realities are broadened to include common and uncommon medical events. The reality consists of more than given factual circumstances: It is a vision that needs to connect with students' own lives - in terms of being “lifewide” (Jackson, 2009) rather than stereotypically narrow.

b) Constructing and sustaining the scene

Simulation educators can learn much from dramatists/ novelists in setting the (human) scene for participants. Who are the protagonists/ antagonists in the human drama? Where is the (human) incident set? What is the geography of the surgery/hospital/clinic/A&E? Responses to these questions will help set the scene.

The challenge for educators, and ultimately the students, is to make the situation ‘real’. How much to tell/show students so they will engage in the fiction and how much to leave out? It is important for educators to make conscious decisions as to which information is central and which is extraneous to help students be involved in the situation.

The closer the circumstances to students' own realities, the more likely they will abide by the [shared] fiction. However, it is also important to expand their horizons so they can encounter less common events.

c) Drawing on people and situations from a broad vision of society

As indicated already, simulation educators need to draw upon a broad, inclusive vision of society. Some educators' and students' taken-for-granted assumptions about prospective patients and their representation via mannequins and technology need to be challenged: Patients are not all white, middle class, adult, literate, articulate, or English-speaking.

Authentic simulations of patient encounters, clinical practice, and basic transactions, need to draw upon representatives from the broader society. A major flaw in the notion of a 'standardised patient' is there is no such thing: Prospective medical practitioners require exposure to patients from a range of cultures where human encounters are not taken-for-granted. The trained actors mentioned earlier provide some of the variety and volatility of real patient encounters.

The challenge for educators is to align the (individualised) possibilities of diagnosis presented by mannequins/virtual reality patients with the realistic (socialised) encounters made possible by trained actors. At present the two educational interventions serve contrasting purposes.

A second challenge is to prepare students to connect with belief systems, values, religions, cultures and personal perspectives different from their own. Human encounters are not culture free. The 'incommunicative' mannequins mentioned earlier do not fit the bill.

d) Providing inter-positional opportunities

Inter-positional knowledge is what team members gain by working together - in regard to their respective roles, responsibilities and specialist qualities, (Gum et al, 2010). This kind of knowledge is difficult to acquire in a curriculum focussed on the acquisition of individual skills. The challenge is to provide team-based opportunities within and across health discipline areas - where membership is truly representative of clinical teams/crews active in the real health arena. Membership involves more than involvement in cognitive team skills: it includes an ability to 'get along' in teams, recognise and appreciate the contribution of other team specialists and be able to define one's own team role and 'positionality'.

e) Enabling knowledge transfer to real patients

Knowledge transfer from simulated situations to actual clinical practice is not an automatic process. However, simulations can achieve high level transfer to real patients with relatively low cost methods if students temporarily suspend disbelief and interact with the simulation as they would in the real world, (Issenberg and Scalese, (2008). By giving appropriate amounts of detail and drawing on students' own lifewide experiences, educators can make simulated patients more real'. There will be times when educators will lead students out of the comfort zone by exploring simulations drawn from realities beyond their lived experience.

Students require help in making/affirming connections between simulated patients/experience and real patients met in real medical settings; as stated earlier, this may be achieved via opportunities for critical reflection. The latter will require students to recount, analyze, and evaluate individual and collective observations of the simulated experience.

C. Educator-focussed challenges

These challenges focus specifically on the central role of the educator.

a) Making practice deliberate

Research suggests that to transform a novice to an expert, a core component of 'deliberate practice' is essential (Ericsson et al, 1993 quoted in Mercer et al, 2010). Deliberate practice is defined by Mercer et al, 2010:1) as "a regimen of effortful activities designed to optimize improvement". 'Regimen' indicates that practice be applied systematically to have a desired effect on learning.

An obvious challenge for educators is to communicate clearly to students those *specific* practices the simulation was designed to foster. Deciding which simulation factors are central and which are peripheral may not prove easy. Some educators employ red herrings to help students' improve their ability to distinguish one from the other.

Some deliberate practice experiences omit important affective factors. That is, they fail to take into account the feelings of the players experiencing the simulation and/or the connective feelings for real patients in similar circumstances. This is particularly detrimental in the case of medical diagnosis where thoughts might (artificially) at least appear detached from feelings. Note however, it is not unusual for students to be upset when simulated patients "die" during a simulated medical encounter (various authors).

The challenge is for educators and students alike to acknowledge the importance of feelings. Participation, reflection/feedback provides opportunities for feelings to be experienced, expressed, affirmed and supported.

b) Engaging students consciously in professional identity formation

Used judiciously, simulation-based learning processes may contribute both broadly and deeply toward the development of students' professional identity as aspiring health/medical professionals. The notion of 'professional identity' and 'professionalism' are possibly best broached consciously so that feedback on these matters can be incorporated into the on-going dialogue between educators and students. It is easier to align appropriate attitudes and beliefs with actions within the simulation if dialogue is deemed important. The on-going challenge is to employ relevant and significant simulations that clearly fit into the contemporary world.

c) Providing students with timely feedback

Some observers regard timely feedback given during the learning experience to be the most important feature of simulation-based education, (Issenberg and Scalese, 2008).

Feedback would necessarily provide students with opportunities for individual reflection, group/team introspection, and negotiated meaning led by an educator who assists students in linking known information to newly acquired knowledge. A necessary task is to help integrate feedback (teacher and peers) with guided reflection - serving to increase the learner's ability to synthesize knowledge from a range of sources and make sound and safe patient care decisions,(Broussard, 2009).

d) Creating a risk-free environment

Jackson, (2009) points out that 'situations that do not result in a good outcome provide important lessons for learning and future action', (p.16). The affordance of failure without consequence is an important feature of simulation within medical settings.

Satava (2001:239) observes that "all the didactic lectures and mentoring cannot replace the experience of failing, and simulation provides the first safe opportunity to add this unorthodox approach for the enhancement of our conventional education process" .. Feedback on mistakes given by teacher and peers allows students "to further develop their clinical reasoning skills...based on the analysis of their mistakes, as well as feedback from the instructor or review of videotaping of the simulation experiences, learners may repeat the scenario to enhance their learning," (Broussard, 2009:2).

However, simulated learning is likely to fail if educators insist on using the medium predominantly as an assessment process so instead of becoming a site for genuine inquiry, simulation provides an unyielding testing ground. Failure in the simulation here would lead to low grades (negative feedback) rather than experience an opportunity to test, apply, and evaluate knowledge gains.

A simulation might be risk free from a (quasi) patient's perspective but is still risky from the learner's perspective if they are performing and exposing their relative lack of knowledge and skill in dealing with a situation in front of peers and educators. Educators are likely to minimise performance stress from the outset by sharing educational purposes (rationale), ground rules (expectations of all parties involved in the process), parameters

(scope of the process- as far as knowledge permits) and the “real” degrees of risk posed. Educators need to make timely choices about students’ demonstrations of knowledge before peers and educators, and possibly have participants work at one and the same time to minimise the element of “performance”. There will always be cognitive and emotional risks to students when simulation is used for assessing students, particularly if the emphasis is on summative rather than formative assessment. Educators need to make criteria clear and work alongside students to minimise the impact of potential stress on individual and team performance.

- e) Actual life situations are invariably laden with risks. Simulations are often used deliberately to expose students to similar kinds of pressures and dangers found in the actual professional setting. Educators might well choose risk factors that are commensurate with students’ confidence to deal with them. Simulations can be modified to challenge/stretch students’ abilities: The educator’s skill lies in judging the distance one may take students away from their comfort zone without diminishing confidence. *Helping students deal with complexity*

We do know that simulation fails if the information given to students is too overwhelming, too little, or too complex: In regard to the latter, Larew (2006) reports on how challenging novice students with complex patient care simulations resulted in students feeling overwhelmed and anxious. The decision was made to develop a new protocol to provide positive learning experiences that challenge students at their current level of functioning.

It is clearly important that educators match the simulation with the experiences of the students. The challenge is to do this in the light of a content-oriented curriculum. In traditional university settings there is little space (if any) for educators to match the complexity of the learning material to the functioning level of the student. The onus is usually on the student to ‘reach the bar’. Larew’s (2006) focus on “positive learning experiences” is refreshing as it attempts to match the content/ experience/ challenge to the student.

D. Curriculum-focussed challenges

This final set of challenges relates to curriculum-specific factors likely to foster or inhibit simulated-based learning.

a) *Generating a helicopter view of the curriculum*

It is not unusual for faculty members to only view their own part of the curriculum for which they may have responsibility for delivery. But how would it be if the whole curriculum was visible to faculty and students? Not as a meaningless set of subject headings, but expressed as a coherent rationale pertinent to particular junctures in the students’ progression from Year 1 to Year 4/6. Simulations might be delivered as timely interventions sited at various points of the curriculum. These points would be strategically aligned with the perceived progress of students. Thought then could be given as to which type(s) of simulations might provide appropriate intervention and at what point(s)?

The challenges would be to identify the actual progress of students, determine appropriate intervention points, and decide on the kinds of simulations for matching needs. Summative assessment would be overshadowed by the need for keener observations on the formative aspects of assessment/feedback that indicate the actual path of student progress.

b) *Integrating traditional knowledge, simulation, and being with real patients*

Finding the right mix of traditional learning, simulation-based learning, and actual patient experience is an important challenge, (Gaba, 2004). How possible is it to integrate simulated learning with traditional learning (lectures, labs, tutorials) with actual patient care? What does ‘integration’ mean for the quality of the student experience?

The challenge is to create a transparent, collaborative (faculty and students) curriculum so that these facets can be viewed holistically. It is likely that simulation would play an even larger role in creating seamless links between parts.

c) *Incorporating students’ lived experiences into the simulation process*

Experiences met in real settings will invariably inform the simulation content, dilemmas and tasks for exploration. Learning is ideally scaffolded through guided observation (Gaba, 2004), dialogue, teamwork, leadership opportunities, problem solving/setting, issues exploration, deliberation and reflection. A simulation-based learning process potentially invites students, as would-be professionals, *into* circumstances determining health problems, issues and speculations and to take ownership.

The challenge is to incorporate students' lived experiences into the simulated learning event. This involves an obvious valuing of student input - helping them align their rich experiences with the individual realism and shared scenario contexts mentioned earlier.

d) Broadening the curriculum to include team-based simulations

Carroll and Messenger (2008) note that the focus on improving the quality of medical care and the safety of patients has led to a greater appreciation of the work/place of teams rather than solitary providers. This move towards team work does not appear to reflect the individualised skills-acquisition models of preparing graduates that is prevalent in university medical settings.

The challenge lies in educators constructing realistic, goal-based simulations that afford team building opportunities and reflect the workings of the real medical profession? The emphasis is on the 'building' of teams with specific, clear roles and purposes - understood by all players.

Summary of ways to optimise simulation success

Here is a summary of the ways teachers and students might overcome the challenges confronting the use of simulation in healthcare settings.

- a) Be guided by learning intentions not technology/media
- b) Enhance psychological realism/fidelity
- c) Provide opportunities for repetition
- d) Align immersion with opportunities for situation analysis and self/peer[critical] reflection
- e) Connect with students' lived experiences
- f) Communicate clear roles and responsibilities
- g) Maintain a helicopter view of the curriculum where simulation events may be viewed as timely interventions within a transparent curriculum
- h) Tolerate student failure (rehearsal and opportunity for learning not failed performance)
- i) Move from individual skills acquisition to team building and performing capability

Conclusion

This chapter began by outlining some of the main reasons why health/medical educators use simulation for preparing graduates for the health profession. Simulation has been pressed into service to improve patient safety, reduce potential medical errors, bridge the gap between theory and clinical practice, facilitate the delivery of professional skills, and to integrate traditional knowledge with simulation experience and work with actual patients. However, Lateef (2010:4) provides a sober reminder that "there have been no studies (as yet) to show that simulation training improves patient care outcomes directly" ..

Using the learning intentions of health educators as a backdrop, the second part of the chapter outlined four sets of interrelated challenges facing educators wanting to realise their educational objectives with students. These

were learner-focussed; educator-focussed; situation-focussed(including teamwork); and curriculum focussed challenges respectively. These challenges are generic to simulations in other areas of education and training .

The social sciences with professional study component s also tend to engage students in some form of simulated-based learning. For instance, educators dealing with 'interpersonal relations' tend to opt for role-play with its attendant focus on professional roles and responsibilities: psychology (therapist & client); education (teachers and students/parents/principals etc); art & design (project workers & clients); and, social work and community welfare (social workers & clients). Where the emphasis is on circumstances and their analyses, scenario-based learning is often used. Examples being: business management (company success/failure), tourism and hospitality (e.g. impact of climate change), areas of cultural and ethnic diversity (cultural diversity; ethnocentrism); and disaster management . This is not to say that disciplines would not use more than one simulation approach. Common to all is the desire to use simulation to get as close as possible to real-life so that students can experience the roles, responsibilities and processes, and respond in ways that are consistent with the demands of the intended profession and their survival within it. Matters of psychological realism, situational analysis, learner responses, and sound curriculum blueprints will likely effect the success of otherwise of all simulation events determined by individual human agencies.

Underpinning the value and challenges associated with using simulation in all of these professions are two fundamental questions: The first drives many professions that pursue the acquisition of skills as the sole *raison-d'être* for using simulation within the profession:

- (a) *How can simulation help students acquire the technical and interpersonal skills needed for the profession?*

One reason for this question's resilience lies in the prevailing view that simulation is best used to apply subject/disciplinary theory. When the need to provide tomorrow's graduates with real world problems is taken more seriously and there is a migration from a skills-based to a problem-based curriculum, then attention might be given to my second question:

- (b) *How can simulation be used to prepare students, as aspiring professionals for a lifetime of uncertainty and change within the increasing complexity of the professional fields they enter?*

Dormant within this second question is the exciting notion of simulation as both a process of inquiry into an unfolding, unpredictable world, and also as an agenda of possibility - one that still has to be written.

Which question will educators of future professionals pursue into the next decade?

References

- Aitken, P. (2010) Scenario-based disaster health education: "war stories" as vicarious experience. In E.P.Errington, (ed.) *Preparing graduates for the professions*. Mount Gravatt, Queensland, Australia: Post-pressed, [pps. 75-84].
- Betts, K., Lewis, M., Dressler, A. & Svensson, L. (2009) Optimizing learning simulation to support a quinary career development model. *Asia-Pacific Journal of Cooperative Education*, 10(2), 99-119.
- Bleakley, A. (2006) Broadening conceptions of learning in medical education: the message from team-working. *Medical Education*, 40, 150-157.
- Broussard, L. (2009) Simulation-based Learning: How simulators help nurses improve clinical skills, *Nursing for Women's Health*, 12(6), 521-524
- Brown, J.S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, 18(1), 32-42.
- Carroll., J.D. & Messenger, J.C. (2008) Medical Simulation: The new tool for training and skill assessment. *Perspectives in Biology and Medicine*, 51 (1) 47-60.
- Ericsson, K.A., Krampe, R.T. & Romer, C.T. The role of deliberate practice in the acquisition of expert performance. *Psychology Review*, 100, 363-406.
- Errington, E. (ed.) (2010) *Preparing graduates for the professions using scenario-based learning*. Post Pressed, Mt Gravatt, QLD, Australia.
- Gaba, D.M. (2004) The future vision of simulation in health care, *Quality and Safety in Health Care*, 13 (1), 2-10.
- Gammer, S. (2003) Demonstrating professional skills through scenario-based learning. In E.P.Errington, (ed.) *Developing Scenario-based Learning*. Palmerston North, New Zealand: Dunmore Press [pps. 31-39].
- Gum,L. Greenhill, J. & Dix, K. (2010) Clinical simulation in maternity: interprofessional learning through simulation team training. *Quality and Safety Health Care*, 19, 1-5.
- Harden, R.M. & Cairncross,R.G. (1980). Assessment of Practical Skills: The objective structural practical examination (OSPE). *Studies in Higher Education*, 5, 187-196.
- Hsu, E. (1989) Role-event gaming simulation in management education: A conceptual framework and review. *Simulation Gaming*, (20), 409-438
- Issenberg, S.B. & Scalese, R.J. (2008) Simulation in Health Care Education, *Perspectives in Biology and Medicine*, 51(1), Winter.
- Jackson, N. J. (2009), Developing Creativity through Lifewide Education, University of Surrey, UK: Surrey Centre for Excellence in Professional Training. Retrieved on January 13, 2011 from:
<http://imaginativecurriculumnetwork.pbworks.com/f/Developing+creativity+through+lifewide+education+version+5++15+06.pdf>
- Larew, C., Lessans, S., Spunt, D., Foster, D. & Covington, B. (2006) Innovations in clinical simulation: application of Benner's theory in an interactive patient care simulation. *Nursing Education Perspectives*, Jan-Feb, 2006.

- Lateef, F. (2010) Simulation-based Learning: Just like the real thing, *Journal of Emergencies, Trauma and Shock*, 3(4), 348-352.
- Li, S. (2007). The role of simulation in nursing education: A regulatory perspective. Presented at the *American Association of Colleges of Nursing Hot Issues Conference*; Denver, CO. Retrieved March 14, 2011 from [http://www.ncsbn.org/Suling\(1\).ppt](http://www.ncsbn.org/Suling(1).ppt)
- Mercer, S., Jones, N.D., & Guha, A. (2010) A clinical fellowship in health care, *BMJ Careers*. Retrieved on 4th February 2010 from: <http://careers.bmj.com/careers/advice/view-article.html?id=20000744>
- Naidu, S. (2010) Using scenario-based learning to promote situated learning and develop professional knowledge. In E.P.Errington, (ed.) *preparing graduates for the professions*. Mount Gravatt, Queensland, Australia: Post-pressed, [pps. 39-49].
- Satava, R.M. (2001) Accomplishments and challenges of surgical simulation, *Surgical Endoscopy*, 15, 232-241.
- Van Wissen, K. (2003) Developing reflective practice through scenario-based learning. In E.P.Errington, (ed.) *Developing Scenario-based Learning*. Palmerston North, New Zealand: Dunmore Press [pps. 40-49.]
- Voelker, R. (2009) Medical simulation gets real, *JAMA*, 302 (20), 2190-2192.

¹ In 2005, the author delivered several scenario-based learning seminars for the USAF Academy in Colorado Springs. During his visit he was shown the elaborate scenario gaming room used by leaders of the armed forces to plan, practise and evaluate combined military manoeuvres via simulations. While there, he also "flew" an F1-11 (flight simulator) which he crashed into Cheyenne Mountain - escaping with nothing more disastrous than battered pride.