Real challenges in virtual worlds

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Lord Darzi stirred the imaginations of NHS managers and clinicians a decade ago when he introduced them to Second Health—a hospital in the alternate digital world, Second Life. With a personal avatar, participants could engage as staff, students or patients, playing his or her role among other residents (figure 1). It created an enticing prospect of a digital sandbox, where techniques could be practiced without real harm, where technologies could be perfected without real participants and where different ways of organising and delivering healthcare could be demonstrated without disrupting real systems.

A decade later, how far towards this vision have we progressed? Of course, computing power, analytic capability and model sophistication have continued their inexorable progression. Augmented and virtual reality systems have moved from tech labs to the consumer market. Simulations have become more realistic and more fantastic. And many of us worry more about whether our children can tell the difference between real and virtual worlds.

Yet despite technological advances, and the long history of simulation, we still seem to be far from realising its full potential in health care. In my training to become a trauma surgeon, simulation has featured large. It is the only way a trainee gets to manage emergency life-threatening situations without potential grave consequences of mistakes. Procedures such as rapid vascular access in relatively simple limb models, resuscitations on more complex whole-body simulators, surgical procedures on live animal models and scenario-based management of mass casualty incidents using human volunteers are widely employed, and it is now hard to imagine the training of a trauma surgeon without them. Even still, such physiological and patient simulations are not without ethical, effectiveness, cost and accessibility issues, especially in the low-income and middle-income countries that bear 90% of the world’s injury burden. Furthermore, as trauma specialists are increasingly involved as leaders of integrated trauma systems that aim to ensure the timely provision of life-saving and limb-saving care, other types of modelling and simulation are needed to ensure optimal triage and transport protocols for the severely injured, so that each gets the needed treatment in the shortest time.

Simnovate has brought together teams of experts and this supplement provides their perspectives on current status and challenges for simulation in healthcare. More than a status report, though, the groups have helped advance our understanding of how simulation fits into the trajectories of clinical care, teaching and research. They have proposed new and perhaps better ways of conceptualising the place of the virtual among the real, and have laid down challenges for us to think and act differently. Time will tell if they are correct, but they have certainly enriched the discussion.

This supplement contains many great examples of simulation, including those of young...
innovators. Nonetheless, the contributors to this supplement have refused to take such examples at face value. Pucher et al critique where simulation fits when considered through a modern healthcare quality and safety lens. They send a clear message that good-looking simulation models are insufficient, and that robust evidence based on standardised measures are necessary for the field to advance, for it to get buy-in from health professionals and for it to be properly implemented in modern healthcare. Puri et al make a similar case for advancing care in low-income and middle-income countries, and also that the scope of what might be called frugal simulations be widened to benefit many types of endeavour, a role that international agencies could champion (see figure 2).

Madani et al and Pugh et al focus on the role of simulation in innovation. They share a vision that simulated research environments might have many advantages: lower cost, faster results, obviating some of the need for research participants and ethics approvals, just to name a few. As Madani et al say “the health care innovation pathway involves understanding current behaviours and formulating projections on future states, be it assessing product effectiveness, product usability and quality, stakeholder needs, user opinions, or manufacturing quality.” But their enthusiasm to do this through simulation is tempered by recognition that we are still some way from having genuinely useful virtual healthcare research platforms, in which realism depends on appropriate tools, diverse high quality data sets and highly refined models (figure 3).

In the end, we are led to conclude that the impact of simulation depends on its connection with the real more than its distance from it, and on precision and accuracy more than hype and appeal. However, Choi et al remind us that simulation can be more than an imitation of reality, and we should wonder about the unique attributes it might bring. They posit that simulations might be especially useful vehicles for promoting engagement, a phenomenon that is at the heart of the learning process and which today seems often at risk. The authors urge us to resist focusing on individual technical characteristics (scope, modality or environment) and aspects of fidelity (physical, conceptual or emotional), and instead appreciate ‘beauty’ in simulation as an integrative phenomenon. Their conception of beauty is borne from excellence in all of the technical characteristics and fidelity, and they argue that beautiful simulation may help us to identify new ways to inspire. They remind us that the ultimate impression of simulation may be like any other endeavour to affect substantial change: it depends less on what is said, or how it is said, than how it makes us feel.

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REFERENCES