



Road traffic collision simulation: 'storyboarding' as a template for mapping a multidisciplinary training platform.

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Abstract

With 30,000 people being killed or seriously injured on UK roads in 2022, road traffic collision (RTC) training is an essential component of safe and effective casualty management. Whilst many services undertake multi-agency training, exposure to the complex pre-hospital emergency medicine (PHEM) environment is absent or limited in most traditional university courses for healthcare professionals. An effective template for generating complex scenarios, mapping learning outcomes across all these groups is essential to make the most of any multiagency training event. This poster describes a replicable framework for the design of realistic RTC scenarios that challenge the clinical and technical skills of not only the students involved but also the multiagency personnel at all levels of command, to provide a safe and appropriate learning environment for all.



Using a 3-sided arena and live streaming to YouTube (see QR code below) over 300 CU Students (Medicine and Nursing) were able to both observe and participate in the scenarios, allowing an enhanced understanding of the patient journey from point of injury, along with vital introduction to safe scene management and the opportunity to witness a range of non-technical skills



in action, providing context and real-life experience to classroom learning. A questionnaire was distributed to all participants to evaluate the effectiveness in delivering the learning outcomes of the event and a full thematic analysis of this data was completed. A report was also made by the General Medical Council (GMC) who were observing the teaching event.



Introduction

A multiagency team (left) in conjunction with Cardiff University (CU) have developed a template for 'storyboarding' complex RTC simulation scenarios, creating interdisciplinary learning outcomes for all agencies involved. This process is analogous to the development of ISCE/OSCE stations for clinical examinations but adds the complexity of

considering the physical, biological, sociological and psychological factors involved in the lead up to and in the collision itself, as well as the process involved in the patient journey from the roadside to hospital. By engaging all participants in the 'story' we have been able to meet the learning objectives of all trainees, matched to competency and level of experience and training.

Methods

As part of medical student training in CU, our team ran a one-day, 4-scenario, multi-vehicle, RTC simulation, involving over 100 personnel from CU, fire, ambulance, police and Medserve (BASICS). Using the wide range of expertise and skill set within our team, each scenario was carefully scripted ('storyboarded') to provide an accurate scene, with appropriate wreckage, mechanism and injury pattern of casualties. To create the storyboard, our team had to consider multiple factors including the clinical scenario, resources, venue and participants (see Figure 1).

These essential requirements helped to provide a template to design realistic, clinically complex and visually impactful scenarios. Each factor needed to be explored to ensure a successful storyboard to provide ample learning opportunities for staff and students as well as being practically feasible to create and deliver safely. Creating blueprints of the scene layout and positioning of patients, vehicles and equipment

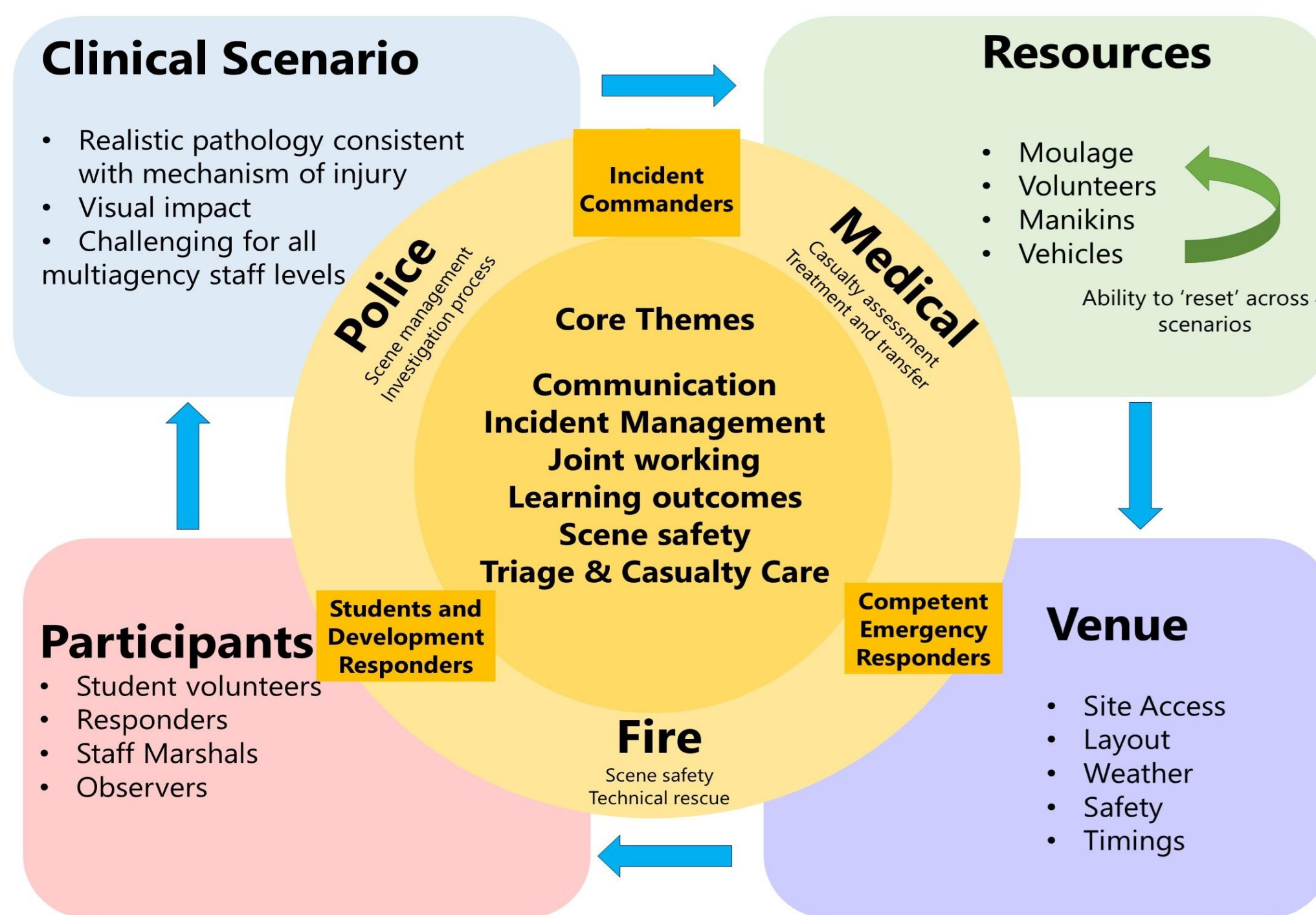


Figure 1. Storyboarding process – multifactorial considerations for effective scene design.

helped our team to visualise the scene in action. The net result was to produce a 'predictable' and yet 'adaptable' storyline that could run in real time, undirected and unscripted for all participants involved, allowing for a 'multiverse' of outcomes whilst still achieving the multi-disciplinary learning outcomes. This could be achieved by creating a working template of each



scenario, outlining practical details for the setup, casualty briefing, injury profiles and expected actions of staff. In this way responders came up with and worked through their plans, as in real tasking at the scene, with the scripted scenario being robust enough to be 'played out' in real time without the need for intervention from the storyboarding staff. The template was then used in the planning stages and on the day as an organisational tool to promote shared understanding. This allowed realistic clinical representation of pathology and

delivery of technical and clinical interventions to provide realistic training for all involved.



Meticulous 'storyboarding' of each scenario represents the 'keystone' process in ensuring the effective delivery of complex, often chaotic yet realistic and immersive simulation experiences.

In the GMC's Quality Assurance Feedback it was noted that: *"The scenarios were designed effectively to simulate some of the stressors present in a real RTC scenario, enabling the students to observe these stressors under controlled circumstances and reflect on them afterwards.Overall, we found the simulation event to be a good demonstration of how Cardiff Medical School meets our standards, specifically regarding the provision of simulation and technology enhanced learning and multi-professional learning opportunities. We have identified this as an area working well for the school."*

In addition, a paramedic attended an entrapment RTC with a driver sustaining serious multiple injuries the day after this event. He contacted the team to say how much more confident he felt in managing the scene and said how the learning identified at the simulation was implemented in practice at the scene.

Conclusion

The ability to generate complex, 'chaotic' and realistic scenarios as well as the opportunity for full multiagency team working was noted as being essential in providing opportunity for multidisciplinary learning. These simulations open up the potential for generating 'cross agency' learning and training assessment events to promote interagency understanding of casualty care. With the increasing implementation of complex medical interventions at the roadside, increased exposure of all emergency practitioners will surely enhance their efficacy and effectiveness in delivering the best patient outcomes. We hope these developments will stimulate other medical schools and regional emergency services providers to consider adopting this approach to promote and enhance the delivery of pre-hospital care.

Results

Thematic analysis of the evaluation survey from 75 respondents revealed that respondents found the realistic/visceral nature of the scenarios, the demonstration of multiagency teamwork and enjoyment in participation to be of most importance in the delivery of the learning outcomes (see Figure 2). The survey also revealed how informative the training was and the importance of a high level of organisation and timing associated with the event.

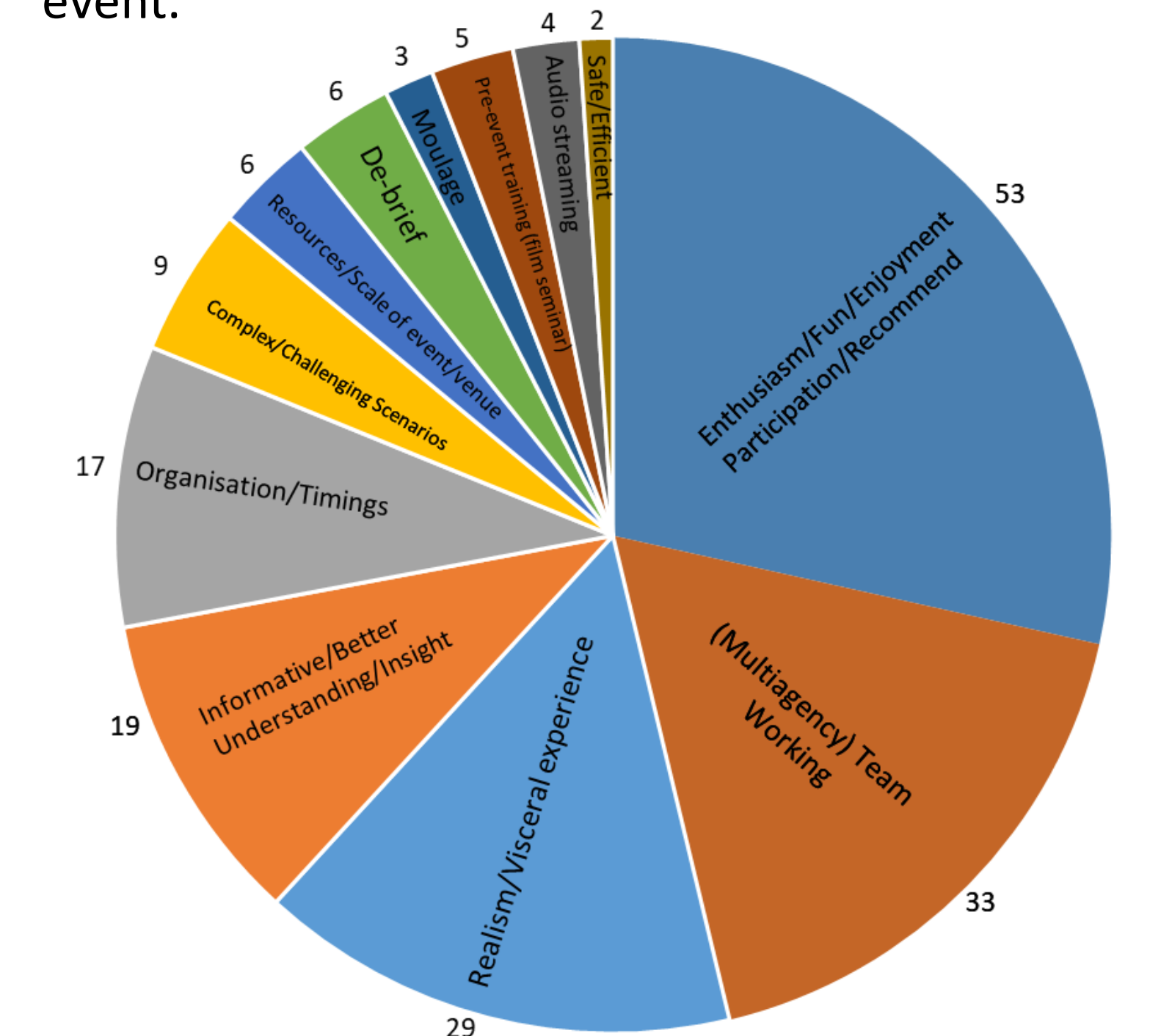


Figure 2. Thematic analysis of an evaluation survey (n=75)



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