



Scoping the integration of simulation-based education in the delivery of healthcare education programmes delivered within the North of England: opportunities for further expansion

Executive Summary

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Introduction

Simulation-based education refers to “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) (p. i2). Simulation-based education provides opportunities for learners to develop and improve their skills and competencies in a safe environment without the associated risk to patient safety (Naik & Brien, 2013). Unlike experience gained in practice, where the needs of the patient are paramount, simulation exercises are centred upon the particular needs of the learner and can be tailored to meet required learning outcomes. This can be particularly advantageous for interventions that are known to be high risk or infrequently encountered in practice, and therefore unlikely to be experienced during clinical placements (Ziv, Small, & Wolpe, 2000). Simulation-based education has consequently become recognised as a valuable instructional approach to preparing healthcare students for practice and now features in many pre-registration healthcare programmes (Kneebone, 2016). Professional regulatory bodies are also increasingly recognising simulation-based education as a valid substitute for clinical placement hours (Hayden, Smily, Alexander, Kardong-Edgren, & Jeffries, 2014) .

In terms of learning outcomes, simulation-based education has been found to have positive effects with regards to psychomotor skills development (Shin, Park, & Kim, 2015), clinical knowledge (Cant & Cooper, 2017b), and learner confidence and self-efficacy (Shinnick, Woo, & Menten, 2011). Simulation-based education is also being utilised as a means to deliver inter-professional education as a mechanism to support the development of positive team-based work cultures and effective inter-professional practice. Inter-professional simulation-based education, in which students from two or more different disciplines learn together, has been associated with improved inter-professional communication and collaboration, an appreciation of inter-professional team roles, improved self-confidence, and positive attitudes towards inter-professional learning (Labrague, McEnroe-Petite, Fronda, & Obeidat, 2018). Simulation-based education is a resource intensive educational intervention that requires significant financial investment with regards to physical resources and faculty time (Lin, Cheng, Hecker, Grant, & Currie, 2018). As such there is a need to maximise the effectiveness of the way in which simulation-based education is organised and delivered.

Purpose of research study

Many higher education institutions (HEI's) and National Health Service (NHS) Trusts have already introduced simulation-based education as part of pre-registration healthcare education programmes. This has required notable investment in educator development, the production of teaching resources, and investment in simulation equipment and infrastructure facilities to support the effective integration of simulation-based education approaches. This study was commissioned by Health Education England (HEE) North, to scope the integration of high-fidelity simulation-based education in the delivery of undergraduate/ pre-registration healthcare professional education, and to explore opportunities for further expansion. It did so by undertaking a review of existing evidence (review of reviews), and an online survey and qualitative telephone interviews with simulation educators in NHS Trusts and universities. Relevant stakeholders were brought together in a final face-to-face event, where preliminary findings were 'sense-checked' and input was sought into recommendations for HEE North.

Overview of findings

Findings from the literature review

The reviewed literature review revealed several dimensions of best practice in relation to simulation-based education. The dimensions spanned human and physical resources, curriculum integration, and simulation design and delivery. The evidence concerning human resources focused upon the central facet of facilitator competency. Competency encompassed the facilitator's knowledge and skills regarding pedagogy, clinical expertise, and curriculum requirements, alongside an ability to create a safe learning environment for students, including constructive and supportive debriefing sessions. The literature concerning physical resources centred upon the need for available, accessible, and appropriate space in which to deliver simulation-based education sessions in a controlled environment. Curriculum level integration of simulation-based education provision was found to enable and support best practice principles associated with effective learning, including the timing of simulation-based education within the broader programme of study, intentional sequencing of simulation exercises with associated teaching and learning content and clinical activities, the opportunity for graded difficulty and repeated practice, and clear linkage with defined learning and competency outcomes. Clearly established learning outcomes were similarly found to support the identification and implementation of optimal simulation design characteristics including decisions concerning the most appropriate level of fidelity, instructor modelling, individualised learning strategies, and student role assignments. The presence of a pre-briefing was found to foster engagement and alert students to the salient elements of the simulation. The debrief component was widely considered to be the most critical component of simulation-based education because it provides the opportunity for constructive and critical reflection, and the integration of simulated learning with clinical practice.

The literature cited several barriers and enablers to the provision of simulation-based education. Barriers arising from a lack of physical resources included insufficient space and equipment to deliver simulation, low levels of equipment maintenance, the high cost of purchasing simulation equipment, and a lack of financial support and investment at an organisation and department level. Insufficient human resources were also cited, including a lack of access to available and appropriate simulation training and a subsequent lack of simulation trained teaching staff, uncertainty within staff teams as to how best to incorporate simulation technology into teaching, and fear or reticence regarding new technology. Barriers such as insufficient time to accommodate the additional workload associated with simulation, including both planning and delivery, were also referenced, alongside a lack of adequate scenario development. Inter-professional simulation was found to pose additional challenges with regards to difficulties associated with timetabling, addressing the learning needs of diverse professional groups, the logistics of providing timely high-quality debriefing to multi-professional groups, and a lack of established interdisciplinary relationships. Enabling factors facilitating the provision of simulation-based education included the availability of accessible staff training concerning the writing, programming, delivery, and evaluation of simulation-based education; teaching strategies built upon evidence-based teaching theory; and staff characteristics such as interpersonal, teaching and clinical competency. The provision of simulation staff including dedicated simulation coordinator and technological support roles, and the presence of organisation administration support for simulation were also reported to be advantageous, as were financial incentives, such as additional paid time for simulation activities.

Findings from the survey and interviews

The study gathered data from 54 survey respondents and 19 interview participants, all of whom were involved in simulation-based education in universities and NHS organisations in the North of England. The key findings of the survey related to human and physical resources, and the need for strategic leadership. In the survey, a lack of available, appropriate, and dedicated space was the most frequently cited barrier to the provision of simulation-based education. This was followed by a lack of available suitably trained staff, and a lack of time to develop and deliver simulation-based education sessions, with respondents emphasising the time intensive nature of developing, planning, and organising simulation-based education sessions. Almost one third of respondents did not have access to any form of library from which to draw simulation scenarios when planning simulation exercises and only half of survey respondents felt that the scenarios that were used with students were evidence based. Although the majority of respondents indicated that the simulation scenarios were typically developed and aligned to the curriculum, the use of a framework to develop or structure scenarios was reported much less frequently, as was the process of peer review in relation to newly developed scenarios. The additional resources that were requested most frequently concerned larger and more dedicated spaces, and an increase in simulation trained staff. Notably, the third most frequently requested resource related to a need for clear strategic leadership.

Themes regarding strategic leadership and resources were also reflected within the qualitative interview findings. Strategic leadership was cited by the majority of participants as a key component in establishing successful simulation-based education provision. Confusion regarding simulation terminology, and a lack of awareness and understanding regarding the scope and application of simulation-based education, particularly amongst higher level managers was perceived as a barrier to organisational investment and meaningful curriculum integration. The creation of simulation infrastructure, through the development of simulation strategy documents and implementation groups was felt to be an enabling factor. The absence of a formal strategy for simulation-based education was felt to result in ad-hoc ways of working and fragmented provision. This lack of clarity created uncertainty regarding the quality of the simulation being delivered due to a lack of clearly defined objectives and benchmarks.

Participants suggested that greater collaboration between organisations within the North region could offer a potential opportunity to improve access to simulation resources, improve efficiency, encourage the sharing of expertise, and reduce duplication. There was concern that current funding arrangements constitute a probable barrier to integration. A national approach to simulation that involved an overarching strategy was suggested as a useful way of providing guidance on inter-organisational working. Improved links between NHS organisations and HEIs was suggested as potential means to capitalise on organisational strengths and staff skills sets with the aim of improving the design and delivery of scenarios. Current practices regarding the funding of simulation were also perceived as a contributory factor to siloed working practices, with individual departments seeking to protect their own resources, despite working for the same organisation.

The interview findings reaffirmed the concerns raised by survey respondents in relation to human resources. Staffing shortages and a lack of staff training regarding the pedagogical underpinnings of simulation, the development of simulation scenarios, and the practicalities of delivery were felt to

represent a key barrier to successful implantation. Poor access to relevant training meant that important components, such as the debrief, were not managed in an optimal way. Participants felt strongly that it was essential for staff involved in simulation-based education to receive appropriate training and were clear that a lack of knowledge could be potentially detrimental to students' learning. Investment in staff training and the development of training resources was regarded as a key enabler for the improvement of the development and delivery of simulation. The interview participants reiterated the challenges identified within the existing literature and survey data regarding inter-professional simulation. The difficulties centred around timetabling constraints and the challenge of developing scenarios that meet the learning outcomes of students from different programmes. Discrepancies between the degree to which simulation was embedded within undergraduate/pre-registration curriculum and the degree to which it was supported by professional regulators was also felt to contribute to inequality in terms of access to resources for different professional groups.

The findings of both the survey and interview data indicated that the majority of participants were of the understanding that their organisation was intending to increase simulation-based education capacity. Interview participants highlighted that improvements in leadership, organisational buy-in, simulation strategy, staffing levels, and staff training would be needed in order to achieve the intended expansion whilst also maintaining the quality of the learning experience. Concerns regarding quality were also echoed within the discussions that took place during the stakeholder event in which attendees highlighted their concerns that suboptimal learning experiences could be potentially detrimental to the learning and wellbeing of students. It was felt that organisations had an obligation to ensure that simulation-based learning was sufficiently resourced to ensure that staff are supported in their roles and students are provided with a safe learning environment. Strategic leadership was seen as vital in ensuring that the future development of simulation infrastructure avoids duplication, establishes quality assurance benchmarks, and enables working practices and processes that effectively support those involved in simulation-based education.

Findings from the stakeholder workshop: looking to the future

The stakeholder event was attended by 13 participants that occupied a range of roles concerning simulation-based education in NHS Trusts and Universities. The primary aim of the Ketso workshop was to explore the views and opinions of participants with regards to areas of development and potential resources that would most effectively support and enable the continued advancement of simulation-based education in the North Region. The recommendations generated by the participants primarily concerned three main areas: clarity regarding simulation terminology, strategic leadership, and the development of accessible training resources.

The variation in how simulation terminology was understood and operationalised was felt to contribute to misunderstandings regarding the scope and value of simulation-based education amongst high level management, colleagues, and students. It was felt that greater coherence and consistency in relation to simulation terminology would support a wider understanding of the resources required to provide quality simulation-based education in undergraduate/pre-registration programmes. Increased understanding and clarity regarding simulation-based education was felt to be key to facilitating organisational buy-in and further investment. In particular, typologies based upon high or low fidelity were felt to have little utility given the term's historical conflation with

technology. Instead, it was argued that it would be important to focus on simulation as a technique rather than technology, and that consensus should be sought on how to describe the nature/ level of simulation in terms of closeness to 'real' clinical practice. Agreement on definitions and terminology/ language used to describe different types and 'levels' of simulation-based educational activities is warranted to enable a shared understanding, more consistent reporting and indeed better strategic understanding and support.

The need for strategic leadership arose at each stage of the study. Strategic planning, coordination, and implementation was seen as key to maximising existing resources, improving the efficiency of the processes underlying the development and delivery of simulation-based education, and reducing duplication. A clearer leadership structure was also seen as essential in terms of enabling greater collaboration and the sharing of resources and skills between departments and organisations, and in supporting the dissemination of the evolving evidence-base concerning simulation best practice. The participants at the stakeholder event also raised the potential for the development of a career pathway for educators and clinical staff who wished to develop expertise in simulation-based education. The need for accessible and relevant training resources was also highlighted throughout the study. Participants suggested that a mapping exercise regarding training needs may be beneficial in identifying training gaps and developing relevant resources. The development of a practical evidence-based toolkit to inform the development of simulation-based education scenarios and activities may aid awareness of the considerable evidence base now underpinning simulation-based education. It may further serve to reduce the duplication that is apparent within the creation of simulation-based educational content, and thus improve efficiencies in design and delivery.

Recommendations

- The development of nationally agreed terminology and key definitions so as to promote greater clarity and a clearer understanding of simulation-based education amongst educators, higher level managers, and learners.
- The development of a clear leadership structure and associated roles to enable greater collaboration and the sharing of resources and skills between departments and organisations, and to support the dissemination of the evolving evidence-base concerning simulation best practice.
- The development of a simulation strategy to guide the development of simulation infrastructure and resources across the region whilst avoiding duplication and maximising existing resources
- A mapping exercise regarding educator training needs in order to identify training gaps within the workforce, the development of a faculty development plan for the region, and the development of comprehensive and relevant training resources
- The development of a practical evidence-based toolkit to define and illustrate best practice in simulation-based education and inform the development and delivery of simulation-based education resources, scenarios, and activities.