

## ORIGINAL RESEARCH

# Translating the healthcare simulation standards of best practice for low-resource settings: Operational strategies in health professions education

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## ABSTRACT

**Background:** Healthcare simulation is increasingly recognized as a transformative educational methodology. The International Nursing Association for Clinical Simulation and Learning (INACSL) developed the Healthcare Simulation Standards of Best Practice (HSSOBP) to guide high-quality simulation-based education (SBE) however, implementing these in resource-constrained settings poses challenges due to economic and cultural barriers.

**Methods:** A team from universities in Uganda, USA and Eswatini collaborated to contextualize and translate the HSSOBP for low-resource healthcare education settings. Using independent reviews and group discussions, the team analysed each standard for operational feasibility, contextual challenges, and resource-aligned solutions.

**Results:** Adaptation included enhancing organizational readiness through faculty and staff capacitation on SBE, simplifying operational strategies, using low-fidelity equipment, interdisciplinary collaboration and mobilizing local resource structures to support and sustain simulation programmes.

**Conclusions:** The translated HSSOBP guide the integration of SBE pedagogy in low-resource settings. This framework suggests practical and contextualised strategies without compromising the quality of education.

**Key Words:** Healthcare simulation standards, Low-resource settings, Simulation based education, Translation

## 1. INTRODUCTION

The HSSOBP, developed by the International Nursing Association for Clinical Simulation and Learning (INACSL), promote effective simulation-based learning experiences to achieve desired learning outcomes.<sup>[1]</sup> However, the developers of the HSSOBP also acknowledge that the standards are aspirational and ideal but pose implementation challenges in

some contexts.<sup>[2]</sup>

Sim4Africa, a multidisciplinary team was formed to increase access to high-quality healthcare simulation experiences for South and Southeastern Africa healthcare workers and students. While establishing or continuing to offer simulation-based-education (SBE) in healthcare training in rural and low resource settings, the team identified the challenge of en-

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acting the updated Healthcare Simulation Standards of Best Practice (HSSOBP). Consequently, they sought to translate and contextualize the HSSOBP for these settings, demonstrating how health professions' educators and schools can meet these standards despite economic and cultural barriers.

### Low resource settings

The translation was conducted based on three reference case schools that make up the Sim4Africa team. Busitema University, Faculty of Health Sciences, located in Eastern Uganda, the University of Eswatini, Faculty of Health Sciences in Mbabane, Eswatini and the Boise State University, College of Health in Boise, Idaho in the United States. Common to the African settings are limited resources in implementing SBE for the health sciences' training in terms of infrastructure adequacy, trained faculty and staff, technology, equipment, and supplies, etc., coupled with sociocultural challenges that may stifle the integration of this pedagogy.

## 2. METHODS

The purpose of this paper is to discuss the Sim4Africa team's views on increasing awareness and confidence in the implementation of the HSSOBP for health professions' education in rural and low-resource simulation education settings. The team included five nursing faculty members, a simulation operations' specialist, and an undergraduate research assistant from the three universities. The team collaborated in reviewing the criteria included in the ten standards, guided by the following questions: how could each standard or criterion be explained to colleagues; how to operationalise the standard or criterion for rural and low resource academic settings; and what resources, within their affordances, could be used to meet the standard or criterion? The nursing faculty members from Uganda, Eswatini and the US independently reviewed the standards through the lenses of their countries, universities, and clinical training contexts, focusing on culture, resource availability and access. Following the independent reviews, the group convened to collate their results, identified how each of the standards and criteria could be clarified and to make suggestions for feasibility in implementation.

While simulation programmes exist in healthcare delivery organizations, our focus was on the educational context. We have not presented the standards in the exact order the INACSL lists them: Professional Development, Prebriefing, Preparation and Briefing, Simulation Design, Facilitation, the Debriefing Process, Operations Outcomes, Objectives, Professional Integrity, Sim-Enhanced IPE, Evaluation of Learning Performance and Simulation Glossary,<sup>[2]</sup> but have reordered and grouped these to ensure a stepwise implementation process and ease of discussion.

## 3. RESULTS

### 3.1 Professional development

Standard one: Professional Development is a new addition to the HSSOBP.<sup>[3]</sup> We present this standard first because we believe that simulation centres need an organizational approach for sustainability and success. Programmes with limited resources may only have one or two people who run the simulation-based experiences, but we advocate for organizational support and oversight. Organizational support is key in getting started with simulation. Therefore, we suggest that health professions' education institutions should first conduct a needs assessment to identify the priority professional development needs for SBE. HealthySimulation.com has a freely available tool, the Simulation Culture Organizational Readiness Survey (SCORS), developed by Leighton, Foisy-Doll, and Gilbert,<sup>[4]</sup> to assess organizational readiness for simulation. We recommend completing the SCORS or any equivalent needs assessment tool before further planning the simulation programme.

Standard one emphasizes the need for clear goals, mission, and vision statements for the simulation programme, aligned with educational institutions and developed with stakeholder input. Multidisciplinary participation (e.g., nursing, medical education, pharmacy) is encouraged from the outset, even in the development of programme goals. A centralized budget for simulation across multiple disciplines is recommended, rather than a single department bearing the costs.

The organizational plan is developed from the vision and mission statements. This plan should include the professional development of faculty (management/administrators, nurse educators/lecturers, clinical instructors, and support staff). We recommend that simulation champions are designated from faculty and staff in each discipline to receive simulation training. These champions would orient colleagues to the simulation programme and perform facilitator evaluations. One major challenge we identified was a lack of affordable training programmes for simulation faculty and operations specialists in low-resource settings. The implications of having untrained faculty offering SBE include the inability to integrate this pedagogy despite its advantages. Nonetheless, integrating SBE without the proper faculty preparation could affect implementation,<sup>[5]</sup> such as ineffective facilitation, low student engagement, lack of realism and poor management of resources. Currently there are only a few ways to access low or no-cost training, support, and information for select low-resource contexts. The Society for Simulation in Healthcare (SSH) and INACSL have membership fee scales based on the country, with significantly reduced rates for members from low-income countries. Both organizations have affinity

groups with robust discussions amongst simulationists from around the world. The George Washington University School of Nursing<sup>[6]</sup> offers free access to a simulation training programme on the MOOC platform. Our plan as a Sim4Africa team is to develop resources and a repository for educators in rural or low-resource programmes.

### 3.2 Operations

The standard on operations is listed sixth in the introduction of the HSSOBP version<sup>[7]</sup> however, it is the foundation of the simulation programme, given that it consists of a strategic plan that helps the programme achieve its mission and vision. The strategic plan describes the scope and purpose of the programme, the orientation process for new faculty and staff members, the ongoing evaluation of the programme, space and material management, policies and procedures, and the budget. The scope and purpose are important to consider first, as they will impact the type of participants and simulations (internal organization only or including fee-based services to the healthcare education community).

Trained champions can orient and evaluate faculty and staff in the simulation programme. We recommend a simulation director with a clinical background to oversee curricular integration and interdisciplinary simulations, and a programme manager for administrative and management tasks. If only one role is feasible, we suggest prioritizing the programme manager who is a faculty member or administrator, to coordinate day-to-day operations, manage the simulation lab schedule, ensure supply availability, oversee community outreaches, develop educational scenarios, and identify curriculum gaps. The manager or director can verify board/licensure requirements and advocate for simulation as a teaching method. They, or the faculty, can also train standardized patients (SPs) if the programme includes SPs.

Policies and procedures for the programme clearly describe expectations and ensure consistency across disciplinary programmes and facilitators. The Society for Simulation in Health offers a policy manual template.<sup>[8]</sup> In addition, several academic websites have accessible repositories and online libraries to use when developing and adapting existing templates for simulation design, debriefing tools (American Council of Academic Physical Therapy<sup>[9]</sup> Health Education and Training Institute;<sup>[10]</sup> National League for Nursing.<sup>[11]</sup> The SimTech<sup>[12]</sup> and supply management will aid the programme, in running smoothly. Policies should also outline the use of formative versus summative assessments, quality control standards from licensing boards, and an organizational chart with clear roles and responsibilities.

The budget should be realistic and include a sustainability

plan. SCORS Subsection B emphasizes key elements: personnel, supplies and equipment, faculty release time, and dedicated spaces for scenarios and debriefs. The mission and vision may evolve, and programme scope may expand as the programme develops. Programmes do not need expensive equipment initially but should prioritize financial support for faculty and staff training. We recommend that institutions should seek local or national business sponsorships for simulation laboratory segments or equipment.

### 3.3 Professional integrity

Standard eight<sup>[13]</sup> is about professional integrity. It addresses the need for each person who works in healthcare simulation-based education to understand the SSH healthcare simulationists code of ethics.<sup>[14]</sup> The code includes six key concepts. Integrity calls for honesty and fairness, transparency includes disclosure of conflict of interest and minimizing deception unless necessary for the scenario, mutual respect amongst all people involved in the simulation, professionalism relating to competence and upholding the simulation standards, accountability to self and others by seeking and receiving feedback and being open to evaluation, and finally results orientation by leading simulations that will improve patient care outcomes.

Orientation to simulation is mentioned earlier as an important part of strategic planning. Ongoing education is another element of professional integrity necessary to ensure continuous adherence to principles and simulation practice standards. Ensuring professional integrity also requires understanding of how simulation relates to disciplinary-specific licensing requirements, practice guidelines and ethics to maintain harmony during interdisciplinary simulation design and facilitation. Creating a safe learning environment for participants, standardized patients (SPs), and simulationists is essential. Scenarios should focus on communication, teamwork, and bias reduction, ensuring respect, cultural sensitivity, and clinical relevance. Simulation experiences should be kept confidential by both the simulationists and the participants. Templates for confidentiality statements or disclosure contracts should be available with each simulation scenario development. Many school-based simulation centres share their statements freely online. For example, the Centre for Medical Simulation<sup>[15]</sup> website has a template that can be used as a reference and benchmark for context-specific customization.

### 3.4 Simulation scenario design

Standard three is titled simulation design and consists of an overview of scenario design and simulation experience facilitation.<sup>[16]</sup> Educational knowledge and skills are required to develop the simulation scenario. While planning to design a

simulation scenario, educators and simulation scenario designers should remember that successful simulation-based learning can be facilitated even with low fidelity equipment. High-technology simulation equipment have utility, but also require maintenance, therefore they are not necessarily crucial for a simulation programme to include, especially at its onset or reboot.

### 3.5 Contents of the simulation scenario

A needs assessment should be conducted to determine the number and contents of the planned simulation scenarios. For established programmes, a gap analysis and current simulation scenario review should be completed. Whereas not every course needs a simulation experience, some may have multiple simulations. Additionally, low-technology simulations, such as tabletop discussions and scenarios that do not require mannequins can be conducted during lectures or lab experiences outside dedicated simulation spaces. The integration plan should involve all stakeholders, including community partners, to identify the greatest needs for SBE. Decisions on which scenarios to include in the curriculum should be based on the strategic plan, simulation centre scheduling, facilitator availability, and the budget.

The contents of the simulation scenarios should address current practice situations and training needs in the area where the participants will be working. Scenarios that involve important but less common clinical conditions or require high acuity, are ideal to include as part of the planned simulations across the curriculum. This will increase exposure to those situations if they are unlikely to be seen during clinical experiences or to serve as interprofessional simulation experiences focused on teamwork and communication. As mentioned, simulation scenarios could also focus on bias reduction or improved patient relationships. For new programmes and those seeking to expand their simulation scenario library, it would be helpful to identify established simulations that match the needs. Using a template for simulation scenarios is highly recommended as it helps all parties involved in the simulation to be consistent and confident in their ability to design and develop simulation-based experiences. There are freely accessible simulation scenario templates online as well as some free completed scenarios that could be edited for context or outcomes.

### 3.6 Outcomes

After content curation, the next step is to determine the outcomes, Standard seven.<sup>[17]</sup> While simulation scenarios can be written to include any knowledge, skills, and attitudes (K, S, A), outcomes specify the scope of the simulation experience. Participant-centred outcomes consider the level of the

learner and their current competency relating to the content. Objectives can be scaffolded using Bloom's revised taxonomy by Anderson and Krathwohl<sup>[18]</sup> and could follow the SMART format (specific, measurable, achievable, relevant, and time-bound).

Outcomes directly influence participant evaluations in simulation scenarios. Both formative and summative assessments, guided by the intended outcomes, can be utilized. It is crucial to distinguish between skills-based checkoffs and true simulation-based experiences. While both might use the same space, apparatus and supplies, their purposes differ. For skill demonstration, a scenario suffices if the goal is skill completion. However, for outcomes involving communication, assessment, knowledge, and skill demonstration, a full simulation scenario is appropriate. We recommend reviewing Reedy's cognitive load theory<sup>[19]</sup> when determining simulation experiences and outcomes.

### 3.7 Fidelity and modality

After setting objectives, scenarios are developed to match the desired level of simulation fidelity. Fidelity refers to the realism of scenario content and context, reflecting what participants would experience in clinical practice.<sup>[20]</sup> Fidelity depends on the learner's level and desired outcomes, with varying degrees expected. Each simulation-based experience should have a plan to achieve the appropriate fidelity, balancing cues, and distractors. The more closely the scenario mirrors the clinical experience in terms of physical space, supplies, medical charts, backgrounds, and roles, the higher the fidelity achieved.

The simulation modality is then selected. Modality refers to the type(s) of equipment used during the simulation-based experience.<sup>[20]</sup> Different modalities include virtual (screen-based), virtual reality (immersive), video-based, high-technology or low-technology mannikins, task trainers, gamification of scenarios, and table-talk discussions, amongst others. There is no superior modality since the selection should match the desired outcomes previously set. If high-technology options are not available or applicable, quality learning experiences can be achieved through using moulage (applying mock injuries) to task trainers or SPs. The identified modalities are reported as affordable and suitable alternatives.<sup>[21]</sup>

### 3.8 Participant-centred design

Participant-centred design involves several considerations. Key factors include level-appropriate outcomes and cognitive load, which encompasses psychological/stress management throughout the simulation experience. For deep learning, the design should feature active participants roles, whether enact-

ing healthcare roles or observing scenarios. The facilitator-student ratio, influenced by licensing or disciplinary standards and intended outcomes, is also crucial. Additionally, peer or paired learning can help reduce psychological stress during simulations.

### 3.9 Scenario facilitation

Scenario templates should be created so that the simulation is fully developed from outcomes to evaluation. Each step in the simulation facilitation process: pre-brief, scenario facilitation, and debriefing must be pre-planned for consistency in facilitation and techniques. Health professions' educators involved in simulation should be oriented and fully trained to effectively manage the responsibilities ascribed to their facilitation role.

### 3.10 Pre-brief

Before participants begin the scenario, there is a period of pre-briefing<sup>[22]</sup> (Standard two). Pre-briefing can happen in two stages, with work assigned before coming to the simulation space and/or an onsite pre-briefing discussion. The simulationists who designed the scenario should have determined the pre-work based on the knowledge, skills, and attitude level needed for participants to engage in the simulation and prepared a semi-scripted pre-brief. Pre-work is an important part of the cognitive load assessment. The amount of pre-work will vary by the level of participants. Pre-briefing onsite includes the confidentiality contract, review of objectives for the scenario and orientation to the space, equipment, and roles for the scenario.

### 3.11 Facilitation

Standard four<sup>[23]</sup> describes the facilitation criteria, focusing on facilitator roles during simulation scenarios. We recommend that facilitators should be trained educators, through formal education, orientation, or mentorship, to ensure learners achieve desired outcomes. A trained faculty must conduct the simulation using the facilitator guide as mandated by the standards. Facilitators should identify benchmarks towards objectives, offer cues<sup>[23]</sup> and support, and may operate and voice the mannikin if no simulation operations specialist is available. Using learning or communication models like Kolb's Experiential Learning Cycle,<sup>[24]</sup> Debriefing with Good Judgment,<sup>[25]</sup> or the advocacy-inquiry model by McArthur<sup>[26]</sup> etc. is recommended to ensure effective facilitation.

### 3.12 Debriefing

The importance of debriefing the scenario is detailed in Standard five.<sup>[27]</sup> The largest learning opportunities occur in the debriefing process. There should be twice as much time

dedicated to the debrief than the scenario itself. The debrief should be described in the facilitation guide as part of the simulation design. The use of Socratic questioning<sup>[27,28]</sup> which embraces advocacy inquiry conversational technique<sup>[29]</sup> rather than lecture, allows for greater learning. A designated private area should be set up for debriefing. There are many models of debriefing<sup>[27]</sup> including, but not limited to Debriefing for Meaningful Learning (DML);<sup>[28]</sup> Debriefing With Good Judgment,<sup>[30]</sup> 3D Model,<sup>[31]</sup> Gather-Analyse-Summarize (GAS),<sup>[29]</sup> PEARLS,<sup>[32]</sup> Healthcare Simulation After Action Review (AAR)<sup>[33]</sup> and Plus Delta.<sup>[34]</sup> We recommend the Plus Delta debriefing method with a double-barrelled approach.<sup>[34]</sup> This is a straightforward approach to debriefing that allows for learner/participant-driven discussion. In this method, the facilitator asks the participants what went well and what could be improved upon if they had this scenario again.<sup>[34]</sup> The facilitator guide should include Socratic questions to help continue or deepen the discussion. To evaluate the effectiveness of the simulations, review the debriefing process using the Debriefing Assessment for Simulation in Healthcare (DASH) tool.<sup>[35,36]</sup> The DASH tools are accessible online through the Centre for Medical Simulation.<sup>[15,36]</sup>

### 3.13 Evaluation

As previously mentioned, the evaluation methods for the simulation are determined in relation to the outcomes. The methods are decided a priori to simulation. Standard ten<sup>[37]</sup> outlines the criteria for evaluation. Formative assessment is a common approach to simulation and sets up a low-stakes evaluation for participants. If summative evaluation is adopted, consider the use of valid, evidence-based tools, inter-rater reliability, repeating options, and managing participant anxiety, such as the OSCE.<sup>[38]</sup> For high-stakes evaluations, such as provider assessments and diagnostics that determine passing or failing a course, using multiple reviewers,<sup>[37]</sup> sufficient pre-brief and clear outcomes and expectations, and due process are additional considerations.

### 3.14 Interdisciplinary professional education

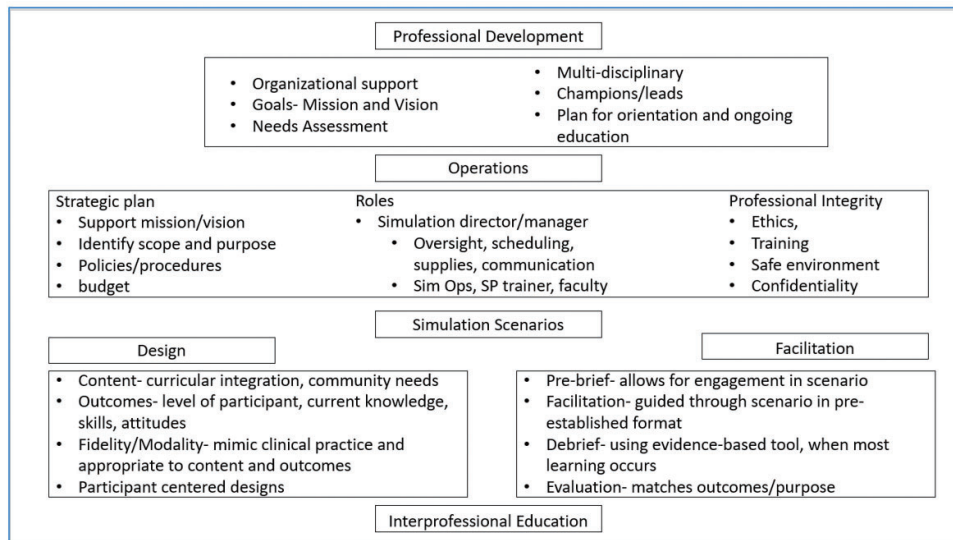
The final standard for discussion is nine, interdisciplinary professional education (IPE).<sup>[39]</sup> Oversight of the simulation programme with involvement from multiple departments is important to overcome some of the challenges faced in academic institutions. Challenges include scheduling, teamwork amongst faculty facilitators, disciplinary-specific requirements for simulation-based experiences, role clarification in facilitation and participation, and hierarchies between the disciplines. For simulations in low resource settings to be successful, collaboration designs based on IPE competencies<sup>[40]</sup> and theoretical frameworks such as the WHO Inter-

professional Education and Collaborative Practice (IPEC),<sup>[41]</sup> the National Interprofessional Competency Framework,<sup>[42]</sup> the Interprofessional Education and Collaborative Practice (IPECP) Model<sup>[43]</sup> by AfriHealth, the ASPIRE model<sup>[44]</sup> etc., should be considered. The simulation team developing the scenarios may consider in situ simulations occurring in the clinical setting to increase fidelity and counter some of the challenges listed. Evaluation of these types of simulations may be formative and done as a group, or each discipline may individually evaluate their participants. There is a great

professional benefit to IPE simulations.

### 3.15 SBE framework for translating HSSOBP for low resource settings

A pictorial SBE process framework for translating the HSSOBP for low resource settings is presented in Figure 1. It illustrates the reordering and practical application of the standards for setting up, integration and continuous improvement of the SBE pedagogy in low resource health professions' academic settings.



**Figure 1.** SBE process framework for translating the HSSOBP in low resource settings

### 3.16 Limitations

This paper has been developed based on the analysis of three settings (Uganda, Eswatini, and Idaho), which may not be representative of all low resource or rural educational settings. Cultural and religious variations are contextual and may pose challenges when these standards are enacted or integrated into health professions' curriculum or programme, therefore, a needs analysis is always recommended to identify potential barriers to effective operationalization of the SBE pedagogy. The output of this translation has not been assessed; hence, we recommend rigorous testing before implementing or adoption to identify and eliminate any barriers that may stifle integration.

## 4. CONCLUSIONS

This document provides a stepwise process for implementing the healthcare simulation standards of best practice in low-resource settings. The translation of the standards could help novice simulation health professions' educators start to use or integrate SBE into their programmes, and those already using SBE may want to use the HSSOBP as guidelines

for quality assurance and continuous improvements in low-resource settings. Key issues highlighted by the translated standards included a needs assessment, training of faculty and staff on SBE, involvement of key stakeholders in all the processes to support SBE programme operationally and administratively to effectively implement and sustain it. The translation of the HSSOBP is not meant to be prescriptive but to guide health professions' educators on how to integrate SBE and adopt sustainable ways to implement the standards despite the prevailing constraints in resources.

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Prof SL, Dr CP, Dr SS, JE, PA and AR, were responsible for the conceptualization, design, development, and review of the project. Prof. SL drafted the manuscript, and all authors revised and finalized the manuscript.

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No additional data are available.

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