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Standards of Best Practice: Simulation

INACSL Standards of Best Practice: Simulation[SM] Simulation Design

INACSL Standards Committee

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As the science of simulation continues to evolve, so does the need for additions and revisions to the INACSL Standards of Best Practice: Simulation[SM]. Therefore, the INACSL Standards of Best Practice: Simulation are living documents.

Standard

Simulation-based experiences are purposefully designed to meet identified objectives and optimize achievement of expected outcomes.

Background

Standardized simulation design provides a framework for developing effective simulation-based experiences. The design of simulation-based experiences incorporates best practices from adult learning,[1] education,[2,3] instructional design,[4,5] clinical standards of care,[6,7] evaluation,[8-11] and simulation pedagogy.[12-16] Purposeful simulation design promotes essential structure, process, and outcomes that are consistent with programmatic goals and/or institutional mission. The design of effective health care simulations facilitates consistent outcomes and strengthens the overall value of the simulation-based experience in all settings.

All simulation-based experiences require purposeful and systematic, yet flexible and cyclical planning. To achieve expected outcomes, the design and development of simulations should consider criteria that facilitate the effectiveness of simulation-based experiences.

Potential consequences of not following this standard may include ineffective assessment of participants and inability of participants to meet identified objectives or achieve expected outcomes. In addition, not following this standard can result in suboptimal or inefficient utilization of resources when designing simulation activities.

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Criteria Necessary to Meet This Standard

1. Perform a needs assessment to provide the foundational evidence of the need for a well-designed simulation-based experience.
2. Construct measureable objectives.
3. Structure the format of a simulation based on the purpose, theory, and modality for the simulation-based experience.
4. Design a scenario or case to provide the context for the simulation-based experience.
5. Use various types of fidelity to create the required perception of realism.
6. Maintain a facilitative approach that is participant centered and driven by the objectives, participant's knowledge or level of experience, and the expected outcomes.
7. Begin simulation-based experiences with a prebriefing.
8. Follow simulation-based experiences with a debriefing and/or feedback session.
9. Include an evaluation of the participant(s), facilitator(s), the simulation-based experience, the facility, and the support team.
10. Provide preparation materials and resources to promote participants' ability to meet identified objectives and achieve expected outcomes of the simulation-based experience.
11. Pilot test simulation-based experiences before full implementation.

Criterion 1: Perform a needs assessment to provide the foundational evidence of the need for a well-designed simulation-based experience.

Required Elements:

- The needs assessment may include analysis of:
  - Underlying causes of a concern (e.g., root cause or gap analysis).
  - Organizational analysis (e.g., Strengths, Weaknesses, Opportunities and Threats analysis).
  - Surveys of stakeholders, participants, clinicians, and/or educators.
  - Outcome data (e.g., from pilot testing; previous simulation-based experiences; aggregate health care data).
  - Standards (e.g., certifying bodies, rules and regulations, practice guidelines).
- The needs assessment includes an examination of knowledge, skills, attitudes, and/or behaviors of individuals; organizational initiatives; systems analysis; clinical practice guidelines; quality improvement programs; and/or patient safety goals.
- Use the results of the needs assessment to guide the development of an overarching goal or broad objective for the simulation, which in turn directs the designer(s) in the development of simulation-specific objectives (see INACSL Standard: Objectives and Outcomes).
- Use the results of the needs assessment to create innovative and interactive simulation-based experiences that aim to:
  - Enhance curriculum in the classroom and/or clinical areas.
  - Provide opportunities for standardized clinical experiences.
  - Address competencies.
  - Improve quality of care and patient safety.
  - Promote readiness for clinical practice.

Criterion 2: Construct measureable objectives.

Required Elements:

- Develop broad and specific objectives to address identified needs and optimize the achievement of expected outcomes.
- Together, broad and specific objectives provide a blueprint for the design of a simulation-based experience.
  - Broad objectives reflect the purpose of the simulation-based experience and are related to organizational goals.
  - Specific objectives are related to participant performance measures.
- During the design phase, determine which objectives will or will not be available to the participant(s) before the experience.
  - Objectives that provide general information and context for the participant(s) should be disclosed (e.g., provide care for a patient with heart failure).
  - Participant performance measures or critical action checklists should not be disclosed.
- Use the measureable objectives to drive the design, development, and approach for the simulation-based experience (see INACSL Standard: Objectives and Outcomes).
- The facilitator assumes responsibility for guiding the achievement of the full set of objectives throughout the simulation-based experience (see INACSL Standard: Facilitation).

Criterion 3: Structure the format of a simulation based on the purpose, theory, and modality for the simulation-based experience.

Required Elements:

- Select the format of the simulation-based experience based on the needs assessment, resources, and broad objectives, taking into account the targeted participants.
- Use the purpose of a simulation-based experience to design and develop either a formative and/or summative encounter.
- Choose a theoretical and/or conceptual framework[15,17,18] based on the identified purpose and the

targeted participants (e.g., adult learners, inter-professional teams,[19] etc.).
- Select the appropriate modality for the simulation-based experience. The modality is the platform for the experience. Modalities can include simulated clinical immersion, in situ simulation, computer-assisted simulation, virtual reality, procedural simulation, and/or hybrid simulation. These modalities are achieved using standardized patients, manikins, haptic devices, avatars, partial task trainers, and so forth.
- Structure all simulation-based experiences to include a starting point, structured participant activities, and an end point.
  - The starting point represents the initial circumstances of the patient or situation when the participants start their engagement in the simulation-based experience.
  - Structured participant activities are designed for participant engagement (e.g., a simulated case or an unfolding scenario, and/or psychomotor skill teaching/evaluation).
  - The end point is the stage at which the simulation-based experience is expected to end, usually when expected learning outcomes have been demonstrated, time is exhausted, or the scenario can proceed no further.

Criterion 4: Design a scenario or case to provide the context for the simulation-based experience.

Required Elements:

- Use a process to design a scenario or case that ensures the quality and validity of the content and supports the objectives and expected outcomes.
- Design the scenario or case to include:
  - A situation and backstory to provide a realistic starting point from which the structured activity begins. The full picture of this context may be given verbally to the participants, found in the patient's file, or be revealed if requested through adequate inquiry on the part of participants.
  - Clinical progression and cues to provide a framework for the advancement of the clinical case or scenario in response to participant actions, including standardization of cues to guide the participant(s). Cues should be linked to performance measures and used to refocus participants when they stray from the intended objectives. Cues should be delivered to participants in a variety of ways, including verbally (e.g., through the patient, provider, or embedded participant), visually (e.g., through changes in vital signs on a monitor), through additional data (e.g., new laboratory results), and so forth (see INACSL Standard: Facilitation).
  - Time frames to facilitate progression of the scenario and ensure that there is reasonable time to achieve the objectives.
  - A script of a scenario or case that is developed for consistency and standardization to increase scenario repeatability/reliability. Variation from the planned dialogue may add distractions that could interfere with the objectives and affect validity and/or reliability of the scenario or case.
  - Identification of critical actions/performance measures that are required to evaluate achievement of scenario objectives. Each measure should be evidence based. Use subject matter experts to strengthen validity of the simulation scenario and the critical performance measures.

Criterion 5: Use various types of fidelity to create the required perception of realism.

Required Elements:

- Design the simulation through attention to physical, conceptual, and psychological aspects of fidelity that can contribute to the attainment of objectives.
  - Physical (or environmental) fidelity relates to how realistically the physical context of the simulation-based activity replicates the actual environment in which the situation would occur in real life. Physical fidelity includes such factors as the patient(s), simulator/manikin, standardized patient, environment, equipment, embedded actors, and related props.
  - Conceptual fidelity ensures that all elements of the scenario or case relate to each other in a realistic way so that the case makes sense as a whole to the participant(s) (e.g., vital signs are consistent with the diagnosis). To maximize conceptual fidelity, cases or scenarios should be reviewed by subject matter expert(s) and pilot tested before use with participants.
  - Psychological fidelity maximizes the simulation environment by mimicking the contextual elements found in clinical environments, for example, an active voice for the patient(s) to allow realistic conversation, noise and lighting typically associated with the simulated setting, distractions, family members, other health care team members, time pressure, and competing priorities. Psychological fidelity works synergistically with physical and conceptual fidelity to promote participant engagement.
- Develop the simulation using the appropriate types of fidelity that create the required perception of realism that will allow participants to engage in a relevant manner.[13,20]

As appropriate, use moulage to replicate features or characteristics of the patient situation and select manikins that represent the race and culture of the patients in the scenario in order to promote the sensory perceptions of participants and support the fidelity of the scenario.[21]

Criterion 6: Maintain a facilitative approach that is participant-centered and driven by the objectives, participant's knowledge or level of experience, and the expected outcomes.

Required Elements:

- Determine the facilitative approach during in the design phase.
- Use a level of facilitator involvement inversely proportional to the participant's knowledge and experience.
- Use a consistent facilitative approach among facilitators for each scenario, case, or simulation-based experience to achieve intervention fidelity.[22] (See INACSL Standard: Facilitation)
- Use facilitators who have formal training in simulation-based pedagogy (see INACSL Standard: Facilitation).

Criterion 7: Begin simulation-based experiences with a prebriefing.

Required Elements:

- Conduct a pre-briefing[23,24] to set the stage for the simulation-based experience by identifying participants' expectations that may differ depending on the level of experience of the participant(s) and theoretical framework.
- Conduct a prebriefing that is structured, planned for consistency, and completed immediately before the scenario/case.
- Incorporate into the prebriefing, activities that help establishment an environment of integrity, trust, and respect. Identify in the prebriefing expectations for the participant(s) and the facilitator(s). This includes establishment of ground rules and a fiction contract (see INACSL Standard: Professional Integrity and INACSL Standard: Facilitation).
- Incorporate into the prebriefing an orientation of the participant(s) to the space, equipment, simulator, method of evaluation, roles (participants/facilitator/standardized patient), time allotment, broad and/or specific objectives, patient situation, and limitations (see INACSL Standard: Facilitation).
- Consider use of a written or recorded prebriefing plan to standardize the process and content for each scenario/case. A written or recorded prebriefing plan should be required for simulation-based experiences when used for high-stakes evaluations.

Criterion 8: Follow simulation-based experiences with a debriefing and/or feedback session.

Required Elements:

- Identify the debriefing or feedback method for the simulation-based experience during the design phase.
- Use a planned debriefing or feedback session to enrich learning and contribute to the consistency of the simulation-based experiences for participants and facilitators. Debriefing and feedback are different, but both are critical elements that should be structured using best practices. In the case of a skills-based or testing simulation activity, debriefing may be replaced by feedback, so the participants are guided to further improve or confirm their practice.
- Use debriefing facilitators who have formal training in debriefing techniques.
- Follow INACSL Standard: Debriefing.

Criterion 9: Include an evaluation of the participant(s), facilitator(s), the simulation-based experience, the facility, and the support team.

Required Elements:

- Determine the evaluation processes in the design phase to ensure quality and effectiveness of simulation-based experiences.
- Adopt an evaluation framework to guide selection and/or development of a valid and reliable tool to measure expected outcomes.
- Ensure that participants are clear on the method of participant evaluation (formative, summative, and/or high-stakes) before or at the onset of the simulation.
- Include in the evaluation process input from participants, peers, and stakeholders.
- Use assessment data to assist in evaluating the simulation program for quality process improvement.
- Follow INACSL Standard: Participant Evaluation.

Criterion 10: Provide preparation materials and resources to promote participants' ability to meet identified objectives and achieve expected outcomes of the simulation-based experience.

Required Elements:

- The designer and facilitator are responsible for ensuring that preparatory activities address the knowledge, skills, attitudes, and behaviors that will be expected of the participants during the simulation-based experience.
- Determine necessary participant preparation in the design phase once all the elements of the simulation-based experience have been identified.
- Design and develop preparation activities and resources to promote the best possible opportunity for participants to be successful in addressing the simulation objectives. These may include:
  - Activities and/or resources to develop understanding of the concepts and content related to the simulation (e.g., reading assignments, concept mapping, coursework, didactic sessions, answering simulation-

specific questions, watching preparatory audiovisuals, completing a pretest, reviewing health record documents, skill review and practice, etc.).
  - Information regarding codes of conduct, confidentiality, and expectations (see INACSL Standard: Professional Integrity).
- Allow for participants to complete preparation activities in advance of the simulation prebriefing.

Criterion 11: Pilot test simulation-based experiences before full implementation.

Required Elements:

- On completion of the design, pilot test the entire simulation-based experiences to ensure that it accomplishes its intended purpose, provides opportunity to achieve objectives, and is effective when used with participants.
- Identify any confusing, missing, or underdeveloped elements of the simulation-based experience during pilot testing and correct before the actual simulation encounter.
- Use an audience similar to the target participant group as the optimal test environment.
- Include in the pilot test an evaluation of the evaluation tool(s), checklists, and other measures to assess for validity and to ensure consistency and reliability (i.e., content validity, expert review, inter-rater reliability, etc.).

Design Templates

Design Templates are available for educators to use that feature evidence-based design and standardize the design process. Samples of template resources are available (see references).

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About the International Nursing Association for Clinical Simulation and Learning

The International Nursing Association for Clinical Simulation and Learning (INACSL) is the global leader in transforming practice to improve patient safety through excellence in health care simulation. INACSL is a community of practice for simulation where members can network with simulation leaders, educators, researchers, and industry partners. INACSL also provides the INACSL Standards of Best Practice: Simulation[SM], an evidence-based framework to guide simulation design, implementation, debriefing, evaluation, and research.

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Standards of Best Practice: Simulation

INACSL Standards of Best Practice: Simulation[SM] Outcomes and Objectives

INACSL Standards Committee

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As the science of simulation continues to evolve, so does the need for additions and revisions to the INACSL Standards of Best Practice: Simulation[SM]. Therefore, the INACSL Standards of Best Practice: Simulation are living documents.

Standard

All simulation-based experiences begin with the development of measureable objectives designed to achieve expected outcomes.

Background

Outcomes

Outcomes are an integral component of instructional and research design. Educators, clinicians, and researchers utilize outcome measures to determine the impact of simulation-based experiences. The Kirkpatrick Model is a commonly used ranking model that evaluates training programs and transfer of learning outcomes.[1] This model depicts four sequential levels of evaluation: (a) *Reaction*—measures participant's satisfaction with training, (b) *Learning*—measures knowledge, skills, and attitudes (KSAs) gained from training, (c) *Behavior*—measures changes that occurred as a result of training, and (d) *Results*—improving quality and safety; increased return on investment following training such as productivity, revenue, and employee retention.

Objectives

Once the simulation-based experience outcome measures have been determined, the next step is to develop objectives. Objectives are the guiding tools to facilitate achievement of simulation-based outcomes and the hallmark of sound educational design. Objectives may be broad or specific as a blueprint for simulation design. Bloom's Taxonomy[2] provides a framework for developing and leveling objectives to meet expected outcomes. The taxonomy classifies three domains of learning: cognitive, psychomotor, and affective. Each learning domain has a hierarchical taxonomy applicable to simulation activities. The revised Bloom's Taxonomy[3] hierarchy progresses from the lower level objectives, remember and understand to the higher level objectives, apply, analyze,

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evaluate, and create. These verbs provide structure and communicate the KSAs the participant is intended to achieve as a result of participating in a simulation activity.

To have achievable outcomes, clearly defined, measurable objectives are necessary. In the field of corporate management, Doran[4] created the acronym S.M.A.R.T. (specific, measurable, assignable, realistic, and time related) as a framework to develop meaningful, measurable objectives. Organizations have adapted the criteria with differing, yet similar criteria. The S.M.A.R.T framework is used to write objectives that focus on the desired KSAs that simulation participants should demonstrate on completion of simulation-based experiences.

The Center for Disease Control[5] provides academia and the health care industry with the following S.M.A.R.T. criteria for writing objectives:

- Specific: What exactly are we going to do for whom?
- Measurable: Is it quantifiable and can we measure it?
- Achievable: Can we get it done in the proposed time frame with the resources and support we have available?
- Realistic: Will it have an effect on the desired goal or outcome?
- Time phased: When will this objective be accomplished?

Potential consequences of not following this standard can lead to ambiguity, unintended outcomes, and failure to meet objectives of the simulation-based experience. This may include skewed assessment and evaluation results; decreased participant satisfaction; failure to achieve desired KSAs; and/or lack of change in quality and safety indicators.

Criteria Necessary to Meet This Standard

1. Determine expected outcomes for simulation-based activities and/or programs.
2. Construct S.M.A.R.T. objectives based on expected outcomes.

Criterion 1: Determine expected outcomes for simulation-based activities and/or programs.

Required elements:

- Expected Outcomes are:
  - Consistent with an organization's, mission, vision, and program outcomes.
  - Driven by the objectives and concepts within program curricula.[6]
  - Represent the multiple cultures and diversity of patients as seen in health care practice.[7]
  - Threaded throughout a program or course.
  - Based on a needs assessment or an area of interest.
  - Addressed by one or more level of evaluation that may include[1]:
    - Individual and aggregate outcomes.
    - Intended KSAs.
    - Changes in behavior/performance.
    - Return on investment.
    - Participant satisfaction.
  - Communicated to participants before the simulation-based experience.
  - Revised as necessary.
  - Follow INACSL Standard: Simulation Design.

Criterion 2: Construct Specific, Measurable, Achievable, Realistic, Time-phased objectives based on expected outcomes.

Required elements:

- Specific objectives
  - Identify participants, scenario, fidelity, facilitation, debriefing, assessment, and evaluation methods.
  - Encompass cognitive (knowledge), affective (attitude), and psychomotor (skills) domains of learning.
  - Clearly identify the targeted learning domain.
  - Address multiple domains of learning.
  - Utilize Bloom's Taxonomy[2] hierarchical classification of learning domains to level objectives from simple to complex.
  - Level the objectives based on the participant's KSAs.
  - Select one action verb for each objective.
  - Avoid verbs with vague meanings.
  - Recognize specificity has greater measurability.
  - Consider "what" will change for "whom" and "how."
    - Identify "what" will be accomplished.
    - Determine "who" will be involved.
    - Consider "how" the objective will be measured.
- Measurable objectives
  - Essential for formative, summative, and high-stakes evaluation (see INACSL Standard: Participant Evaluation).
  - Establish a baseline as a reference point to quantify change.
  - Determine evaluation criteria.
  - Assess the outcome via a method of measurement or an instrument that is reliable, valid, and feasible to obtain.
- Achievable objectives
  - Leveled to participant's knowledge, experience, and skill level.
  - Feasible within a reasonable time frame.
  - Resources are available to attain expected outcomes participants.
- Realistic objectives
  - Consistent with an organization's, mission, vision, and program outcomes.

- Links the objectives to the expected outcomes.
- Appropriate to the KSAs of the participant.
- Aligned with current evidence-based practice, guidelines, standards, and literature.

- Time-phased objectives
  - Determine a specific time frame to accomplish the objective (i.e., minutes, hours, days).
  - Use the specific time frame to plan, implement, and evaluate outcomes.

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Standards of Best Practice: Simulation

INACSL Standards of Best Practice: Simulation[SM] Facilitation

INACSL Standards Committee

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As the science of simulation continues to evolve, so does the need for additions and revisions to the INACSL Standards of Best Practice: Simulation[SM]. Therefore, the INACSL Standards of Best Practice: Simulation are living documents.

Standard

Facilitation methods are varied, and use of a specific method is dependent on the learning needs of the participants and the expected outcomes. A facilitator assumes responsibility and oversight for managing the entire simulation-based experience.

Background

Facilitation of a simulation-based experience requires a facilitator who has the education, skill, and ability to guide, support, and seek out ways to assist participants in achieving expected outcomes.[1-4] To maintain skill as an effective facilitator, one must pursue continuing education and assessment of his/her facilitation skills.[5,6] Selection of a facilitation method is guided by theory and research.[7] Facilitation methods may vary based on the levels of the participants, the simulation objectives, and the context of the simulation-based experience while considering cultural[8-10] and individual differences[11] that affect participants' knowledge, skills, attitudes, and behaviors. Facilitation methods may differ whether the simulation is conducted between faculty and participants interacting in real time or whether participants interact individually with a computer-assisted simulation. Through the use of facilitation methods, the facilitator's role is to help participants in their skill development and explore their thought processes in critical thinking, problem solving, clinical reasoning, clinical judgment, and apply their theoretical knowledge to patient care in a range of health care settings.[12]

Potential consequences of not following this standard may include impairing participants' engagement within the simulation and reducing opportunities for participants to meet the expected outcomes of the simulation-based experience.

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Criteria Necessary to Meet This Standard

1. Effective facilitation requires a facilitator who has specific skills and knowledge in simulation pedagogy.
2. The facilitative approach is appropriate to the level of learning, experience, and competency of the participants.
3. Facilitation methods before the simulation-based experience include preparatory activities and a prebriefing to prepare participants for the simulation-based experience.
4. Facilitation methods during a simulation-based experience involve the delivery of cues (predetermined and/or unplanned) aimed to assist participants in achieving expected outcomes.
5. Facilitation after and beyond the simulation-based experience aims to support participants in achieving expected outcomes.

Criterion 1: Effective facilitation requires a facilitator who has specific skills and knowledge in simulation pedagogy.

Required elements:

- The facilitator demonstrates competency in simulation pedagogy through:
  - Incorporation of the INACSL Standards of Best Practices: Simulation[SM].
  - Ongoing reflection and assessment of his/her simulation-based teaching skill, knowledge, and facilitation performance.[5,6]
- The facilitator acquires specific initial education on use of simulation through formal coursework/training and participates in ongoing continuing educational offerings, and/or targeted work with an experienced mentor.[1,13] (see INACSL Standard: Debriefing)
- The facilitator possesses and demonstrates a substantial skill set related to:
  - Fostering and role modeling professional integrity (see INACSL Standard: Professional Integrity).
  - Applying principles of experiential, contextual, constructivist, sociocultural, and transformative educational theories as well as systems and organizational change theories.[2]
  - Having an awareness of how the diversity of participants and others involved in the simulation-based experience may impact the learning experience.[8,10,11,14]
  - Application of skills in facilitation that include displaying genuine mutual respect, creating a partnership in learning, coaching, developing a dynamic goal-oriented process, managing conflict among participants, and promoting critical and reflective thinking.[15]
  - Creating and maintaining simulation fidelity and use of simulation technology.
  - Identifying participants' knowledge and performance gaps and knowing when and how to respond to participants' action across the simulation-based experience.
  - Providing accurate, specific, and timely feedback.[16]
  - Utilizing theory-based debriefing practices (see INACSL Standard: Debriefing).
- The facilitator has familiarized his/herself with all aspects of the intended simulation-based experience. This includes being familiar with the prebriefing and preparatory resources, the simulation-based experience itself and methods for cueing, and the selected debriefing and evaluation methods.

Criterion 2: The facilitative approach is appropriate to the level of learning, experience, and competency of the participants.

Required elements:

- Assess the needs of the participants. These include preferred approaches to learning, abilities, cultural differences,[8,10] and knowledge and skill level of participants (see INACSL Standard: Simulation Design).
- Determine the facilitative approach during the design of the simulation-based experience (see INACSL Standard: Simulation Design).
- Use facilitation methods that are appropriate to the type of modality used in the simulation experience whether manikin based, standardized patient, hybrid, or computer assisted (see INACSL Standard: Simulation Design).
- Allow the simulation scenario to progress with or without interruption depending on the level of the participants and objectives of the simulation-based experience.
- Achieve intervention fidelity by delivering consistent simulation-based experiences across cohorts of participants.[5]
- Ensure opportunity for the collection of assessment and evaluation data of the simulation-based experience through observation of simulations and monitoring for appropriateness of participants' performance (see INACSL Standard: Participant Evaluation).

Criterion 3: Facilitation methods prior to the simulation-based experience include preparatory activities and a prebriefing to prepare participants for the simulation-based experience.

Required elements:

- Provide participants with information and/or preparatory activities, skills review, and practice time before the simulation-based experience.
- Discuss ground rules to create and maintain a safe learning environment[17] and noncompetitive environment (see INACSL Standard: Professional Integrity).

- Acknowledge that mistakes may happen and will be reflected upon during the debriefing.
- Acknowledge the simulated nature of the learning environment, the differences in learning in a simulated environment[10], and discuss the concept of a fiction contract.[17]
- Hold a prebriefing at a designated time before the simulation-based experience in which the amount of time may vary depending on the modality and complexity of the simulation-based experience.[18-20] Minimally, the prebriefing should include:
  - Discussing the detail and expectations of the simulation-based experience. The level of detail revealed depends on the purpose, goal, and/or objectives of the simulation-based experience.
  - Providing participants necessary background information about the simulation-based experience.
  - An orientation of participants to the simulation environment, modality for delivery of the simulation, manikins, and the equipment that can be used or not used.
  - Providing clear descriptions of assigned roles for the scenario, whether as a direct care provider, as an observer, or as other assigned role characters.
  - Discussing the process to contact others (as needed) during the simulation, and if appropriate, ways to seek further information.
  - As appropriate, providing time for participants to prepare before the start of the simulation experience.

Criterion 4: Facilitation methods during a simulation-based experience involve the delivery of cues (predetermined and/or unplanned) aimed to assist participants in achieving expected outcomes.

Required elements:

- Deliver cues (also referred to as prompts or triggers) to draw attention of the participants to critical or noncritical information related to the context of the scenario or case. Cues can be predetermined or unplanned:
  - Predetermined cues are incorporated into the design of the simulation based on common and anticipated actions by participants (see INACSL Standard: Simulation Design).
  - Unplanned cues (also referred to as life savers[21] are delivered in response to unanticipated participant actions.
- Deliver cues to help participants interpret or clarify the simulated reality or help redirect participants toward the expected outcomes.[22]
- Execute cues during the running of the simulation in a manner that maintains fidelity of the scenario or case.
- Deliver cues using a variety of methods, for example, laboratory results, phone calls from providers or other health care departments, comments from patient, a family member, or triggered by equipment in the room. An embedded actor can be used to provide cues to manage the unexpected events.
- Use a consistent method and mode of delivery of cues when conducting the same simulation across cohorts of participants to help ensure/enhance a standardized simulation-based experience.

Criterion 5: Facilitation after and beyond the simulation experience aims to support participants in achieving expected outcomes.

Required elements:

- Follow INACSL Standard: Debriefing.
- Facilitation continues beyond the simulation-based experience considering learning is a continuous and developmental process as participants form new frames or ways of thinking.
- Facilitation may extend beyond the debrief as participants may need additional time to reflect on, process new knowledge, personally deal with the events that transpired, or clarify clinical experiences that conflict with their simulation experiences.
- Facilitation may extend beyond the simulation-based experience when issues of professional integrity need addressing (see INACSL Standard: Professional Integrity).

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About the International Nursing Association for Clinical Simulation and Learning

The International Nursing Association for Clinical Simulation and Learning (INACSL) is the global leader in transforming practice to improve patient safety through excellence in health care simulation. INACSL is a community of practice for simulation where members can network with simulation leaders, educators, researchers, and industry partners. INACSL also provides the INACSL Standards of Best Practice: Simulation[SM], an evidence-based framework to guide simulation design, implementation, debriefing, evaluation, and research.

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As the science of simulation continues to evolve, so does the need for additions and revisions to the INACSL Standards of Best Practice: Simulation[SM]. Therefore, the INACSL Standards of Best Practice: Simulation are living documents.

Standard

All simulation-based experiences include a planned debriefing session aimed at improving future performance.

Background

Learning is dependent on the integration of experience and reflection. The evidence is clear that essential learning occurs in the debriefing phase of the simulation-based experience.[1-5] Reflection is the conscious consideration of the meaning and implication of an action, which includes the assimilation of knowledge, skills, and attitudes with pre-existing knowledge.[6-8] Reflection can lead to new interpretations by the participants; cognitive reframing is essential to learning.[8,9] The skills of the debriefer are important to ensure the best possible learning outcomes.[10-16]

Integration of the debriefing process into simulation-based experiences enhances learning and heightens participant self-awareness and self-efficacy. Debriefing promotes understanding and supports transfer of knowledge, skills, and attitudes with a focus on best practices to promote safe, quality patient care, and development of the participant's professional role.[17-18]

Potential consequences of not following this standard can lead to unsuccessful debriefing sessions (e.g., deficiency in attainment of learning outcomes or behavior change) and creating a potentially uncomfortable experience for the participant.[18-20]

Criteria Necessary to Meet This Standard

1. The debrief is facilitated by a person(s) competent in the process of debriefing.

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2. The debrief is conducted in an environment that is conducive to learning and supports confidentiality, trust, open communication, self-analysis, feedback, and reflection.
3. The debrief is facilitated by a person(s) who can devote enough concentrated attention during the simulation to effectively debrief the simulation-based experience.
4. The debrief is based on a theoretical framework for debriefing that is structured in a purposeful way.
5. The debrief is congruent with the objectives and outcomes of the simulation-based experience.

Criterion 1: The debrief is facilitated by a person(s) competent in the process of debriefing.

Required elements:

- Implement best practices in debriefing with regard to structuring the format of the debriefing and facilitating reflective discussion.
- Acquire specific initial education through a formal course, a continuing education offering, and/or targeted work with an experienced mentor (see INACSL Standard: Facilitation).
- Seek feedback from both participants and experienced debriefers.
- Actively maintain debriefing skills through active engagement in simulation-based experiences.
- Validate continuing competence as a debriefer through the ongoing use of an established instrument.
- Participate in ongoing education provided by formal courses, continuing education offerings, and/or targeted work with an experienced mentor (see INACSL Standard: Facilitation).

Criterion 2: The debrief is conducted in an environment that is conducive to learning and supports confidentiality, trust, open communication, self-analysis, feedback, and reflection.

Required elements:

- Orient the participants to the overall debriefing process.
- Establish expectations regarding confidentiality of participants' performance, the content of the simulation scenario, and the content of the debriefing discussion.
- Collaborate with participants to develop rules (code) of conduct concerning constructive, honest, and respectful feedback.
- Acknowledge and validate the participants' emotional response to the simulation-based experience and their primary concerns before engaging in reflection on and analysis of actions.
- Demonstrate positive regard for participants by exploring their unique perspectives.
- Guide participants' reflection on personal and contextual factors that impacted decision-making such as past experience, culture, background, personality, skills, and knowledge.
- Use verbal and nonverbal supportive demeanor to encourage discussion.
- Engage both observers and participants in debriefing to support collaborative learning.
- Manage unexpected participant responses.
- Apply principles of group facilitation to ensure the balanced participation of all participants in the discussion.
- Adjust the level of facilitation to that which is required by the group.
- Conduct the debriefing in a conference room or special debrief room separate from where the simulation occurred when possible or as appropriate.
- Facilitate the debriefing immediately after the live simulation session.[3,5]
- Follow INACSL Standard: Professional Integrity and INACSL Standard: Facilitation

Criterion 3: The debrief is facilitated by a person(s) who can devote enough concentrated attention during the simulation to effectively debrief the simulation-based experience.

Required elements:

- Concentrated attention is achieved when the debriefer is not distracted by having to perform multiple functions and roles during the scenario (e.g., playing the voice of the patient, controlling the scenario, queuing the learning and evaluating the activities all at the same time and is able to focus on the most import role(s).
- Establish a climate of professional respect, including a requirement for confidentiality related to the content of the debriefing discussions (see INACSL Standard: Professional Integrity).
- Ensure adequate support to operate technology is available to allow the debriefer to focus primarily on learner evaluation (formative or summative).
- Plan for postdebriefing activities that promote self-reflection and critique.
- Outline the process for debriefing, including the expectation that the participants will drive the discussion as they critically analyze their own performance and provide input into other's performance.
- Choose the appropriate feedback technique, which may include face-to-face, numeric, graphical transcripts of performance from equipment, video conferencing or video replay, checklists, scores, and other forms of feedback.
- Facilitate participants' engagement in the reflective process.
- Provide concrete examples of participant performance.

- Adjust the level of facilitation during the debrief needed to engage every participant in discussion as appropriate for his/her role.
- Provide formative feedback based on scenario objectives, participants' decisions and actions, including reinforcing positive behaviors, correcting misunderstandings, and clarifying cognitive frames that led to incorrect decisions.
- Assist participants in conceptualizing how the learning constructed during the simulation and debriefing can be applied to future clinical situations.
- Include discussion of unexpected topics as needed.
- Facilitate reflection on individual and team performance to achieve targeted performance improvement.
- Facilitate appropriate critical thinking, clinical judgment, reasoning, reflection, and reflective thinking.
- Allow facilitation to be modified based on assessed participant needs and the impact of the experience.
- Summarize learning at the end of the debriefing process to close the gaps in knowledge and reasoning.

Criterion 4: The debrief is based on a theoretical framework for debriefing that is structured in a purposeful way.

Required elements:

- The facilitator uses a debriefing framework and considers the following elements when selecting:
  - Objectives and expected outcomes.
  - Complexity of scenario.
  - Needs of participants.
  - Includes the minimum phases of reaction, analysis, and summary.
  - Level of competence of faculty with the debriefing framework.
  - Simulation scenario/experience.
- Current frameworks available are GAS[21] (gather, analyze, summarize), Debriefing with Good Judgment,[6] PEARLS,[22] Debriefing for Meaningful Learning[23] (DML), Plus-Delta, 3D Model of Debriefing,[24] and the OPT Model of Clinical Reasoning.[25] Frameworks will continue to be developed that are appropriate to be used during debriefing.

Criterion 5: The debrief is congruent with the objectives and outcomes of the simulation-based experience.

Required elements:

- Consider the objectives in the debriefing session.
- Consider the outcomes of the simulation experience and adjust debriefing to include learner-centered objectives.[26]
- During the debriefing session, identify performance gaps based on the expected outcomes of the simulation-based experience.

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About the International Nursing Association for Clinical Simulation and Learning

The International Nursing Association for Clinical Simulation and Learning (INACSL) is the global leader in transforming practice to improve patient safety through excellence in health care simulation. INACSL is a community of practice for simulation where members can network with simulation leaders, educators, researchers, and industry partners. INACSL also provides the INACSL Standards of Best Practice: Simulation^{SM}, an evidence-based framework to guide simulation design, implementation, debriefing, evaluation, and research.

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Standards of Best Practice: Simulation

INACSL Standards of Best Practice: Simulation[SM] Participant Evaluation

INACSL Standards Committee

KEYWORDS
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As the science of simulation continues to evolve, so does the need for additions and revisions to the INACSL Standards of Best Practice: Simulation[SM]. Therefore, the INACSL Standards of Best Practice: Simulation are living documents.

Standard

All simulation-based experiences require participant evaluation.

Background

Simulation-based experiences support evaluation of knowledge, skills, attitudes, and behaviors demonstrated in the cognitive (knowledge), affective (attitude), and psychomotor (skills)[1] domains of learning. Formative evaluation of the participants fosters personal and professional development, to assist the participant in progression toward achieving objectives or outcomes. Summative evaluation focuses on the measurement of outcomes or achievement of the objectives at a discrete moment in time, often at the end of a program of study.[2] High-stakes evaluation refers to an assessment that has major implications or consequences based on the result or the outcome (such as on merit pay, progression or grades).

Authentic evaluation of the participants using simulation-based experiences includes the following elements: (a) determine the intent of the simulation-based experience, (b) design the simulation-based experience to include timing of the evaluation, the use of a valid and reliable assessment tool, and evaluator training required, and (c) complete the evaluation and interpret the results.[3]

Potential consequences of not following this standard may lead to inaccurate assessment, poor participant experiences, poor learning outcomes, failure to progress, inappropriate selection of tools, or assessment bias.

Criteria Necessary to Meet This Standard

1. Determine the method of participant evaluation before the simulation-based experience.
2. Simulation-based experiences may be selected for formative evaluation.
3. Simulation-based experiences may be selected for summative evaluation.

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4. Simulation-based experiences may be selected for high-stakes evaluation.

Criterion 1: Determine the method of participant evaluation prior to the simulation-based experience.

Required Elements

- Participant evaluation is:
  - Directed by the objectives/outcomes and/or the intent of the simulation.
  - Guided by the type: formative, summative, or high-stakes evaluation.

Criterion 2: Simulation-based experiences may be selected for formative evaluation.

Required Elements

- Formative evaluation is conducted to:
  - Monitor progress toward achieving outcomes.
  - Provide ongoing formative feedback.[4,5]
  - Support participant's clinical competencies.
  - Identify and close gaps in knowledge and skills.
  - Assess readiness for real-world experiences.
  - Facilitate teaching and learning.
- Requires formally trained facilitators (see INACSL Standard: Facilitation).
- Use small group ratio, ideally a minimum ratio of one facilitator per three to five students.[6,7]

Criterion 3: Simulation-based experiences may be selected for summative evaluation.

Required Elements

- Summative evaluation is conducted:
  - At a discrete point in time (i.e., at the end of a course or certain time period).
  - In a safe learning environment.
  - After orientation to the environment and equipment.
  - Appropriate level of fidelity necessary to achieve the participant outcomes.
  - Utilizing a standardized format and scoring methods (i.e., utilizing a standardized scenario that includes information on when to cue, scenario length of time, and other scenario details).
  - With a video recording of the evaluation to allow review by multiple trained evaluators.[6,8]
- Use a theoretically based method to determine passing or cut scores[9] where appropriate.
- Select a valid and reliable instrument.
- Provide rater training for observation-based evaluation.[4,5]
- Establish interrater reliability when more than one rater required.
- Inform participants in advance of the evaluation process.
- Provide summative feedback to participant about achievement of outcomes.

Criteria 4: Simulation-based experiences may be selected for high-stakes evaluation.

Required Elements

- High-stakes evaluation is conducted:
  - At the end of the learning process, but may occur at other times to assess gaps in knowledge or to identify significant safety issues.
  - Based on specific participant objectives.
  - After the consequences and outcomes have been explained to the participants.
  - With predetermined parameters for terminating the scenario for its completion.
  - After the simulated-based experience has been piloted tested.
  - By trained, nonbiased objective raters or evaluators.
  - By an objective rater or evaluator using a comprehensive tool (i.e., checklist or rubric that clearly outlines desirable and undesirable behaviors).
  - After the participant has had the opportunity for multiple exposures to simulation-based experiences including evaluations.[7,10]
- Use an evaluation tool previously tested with similar populations.
- Use more than one evaluator for each participant, either directly observed or a video recording.[8]

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Standards of Best Practice: Simulation

INACSL Standards of Best Practice: Simulation[SM] Professional Integrity

INACSL Standards Committee

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As the science of simulation continues to evolve, so does the need for additions and revisions to the INACSL Standards of Best Practice: Simulation[SM]. Therefore, the INACSL Standards of Best Practice: Simulation are living documents.

Standard

Professional integrity is demonstrated and upheld by all involved in simulation-based experiences.

Background

Professional integrity refers to the ethical behaviors and conduct that are expected of all involved throughout simulation-based experiences. Professional integrity is a person's internal system of principles encompassing a number of additional interrelated attributes such as confidentiality, compassion, honesty, commitment, collaboration, mutual respect, and engagement in the learning process.[1-4] Professional integrity is doing what is right in the face of strong countervailing temptation or pressure and regardless of who is or is not watching and continues indefinitely even after the conclusion of the simulation-based experience.[5]

Despite one's role in a simulation-based experience, whether as a participant, facilitator, debriefer, faculty, operator, or other role, all involved with the simulation-based experience are responsible for acting with professional integrity and developing self-awareness of how one's personal and professional behavior affects those around him or her.[3]

All involved in the simulation-based experience need to discuss the attributes of professional integrity especially that of confidentiality. The level or degree of confidentiality is dependent on the policy established by the institution. Organizations must have established methods of sharing student performances.[6,7] There may be a *duty to report* inappropriate behaviors dictated by legal, ethical, and/or institutional regulations.[8,9]

Everyone becomes vulnerable to a certain extent when they are placed within a simulation-based experience; it is therefore imperative that an unequal power balance be recognized and professional boundaries maintained so the knowledge obtained from the simulation learning outcomes are not compromised.[10] Boundary crossings may be inadvertent, thoughtless, or purposeful but these judgments can affect grades, relationships, jobs, positions, and careers.

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There is responsibility to act and monitor professional integrity across all disciplines and professions.

Potential consequences of not following this standard can lead to unanticipated behaviors and/or interference with simulation-based outcomes. Participants may have an inability to be fully immersed in the simulated based experience altering or biasing an individual's performance. It can affect a career, self-esteem, create a sense of distrust in professional relationships, loss of a safe learning environment, and alteration of group dynamics.[1-6]

Criteria Necessary to Meet This Standard

1. Foster and role model attributes of professional integrity at all times.
2. Follow standards of practice, guidelines, principles, and ethics of one's profession.
3. Create and maintain a safe learning environment (see INACSL Standard: Facilitation).
4. Require confidentiality of the performances and scenario content based on institution policy and procedures.

Criterion 1: Foster and role model attributes of professional integrity at all times.

Required elements:

- Attributes of professional integrity include being:
  - Organized and prepared for the simulation-based experience.
  - Accountable for one's role and responsibilities.
  - Collaborative, supportive, nonintimidating, and mutually respectful.
  - Able to share expertise and/or experiences in a safe, nonjudgmental manner.
  - Calm, compassionate, and creating a sense of trust.
  - Cognizant of issues related to the care of diverse populations and the diversity among all involved in the simulation-based experience.
  - Honest, mindful, and sensitive to cultural differences and ethical issues related to the simulation-based experience.
- Recognize unprofessional and unethical behavior during simulation and take steps to abate it.
- Consciously make a personal choice to act with professional integrity.

Criterion 2: Follow standards of practice, guidelines, principles, and ethics of one's profession.

Required elements:

- Always pursue excellence as a member of a profession.
- Abide by the legal and professional standards of practice and codes of ethics that guide one's discipline.
- Remain current in standards of practice, guidelines, principles, and ethics of one's profession.
- Embed professional standards of practice and codes of ethics of participant's disciplines to develop, remind, and reinforce attributes of professional integrity.

Criterion 3: Create and maintain a safe learning environment (See INACSL Standard: Facilitation).

Required elements:

- Clearly communicate the attributes of professional integrity and the importance of confidentiality.
- Support active learning, reflection, and deliberate repetitive practice.
- Provide clear communication and honest feedback in an effective, respectful manner.
- Maintain professional boundaries to minimize fear of negative consequences to professional role/status and personal relationships (i.e., colleague to colleague, peer to peer, teacher to student, or friend to friend).

Criterion 4: Require confidentiality of the performances and scenario content based on institutional policy and procedures.

Required elements:

- Establish policies and procedures for the appropriate sharing of participant performance with those that need to know and have a legitimate educational interest including mechanisms for monitoring, reporting, and addressing violations.[6]
- Establish policies and procedures for securing and destroying written documents, audio, and/or video footage.
- Preserve the integrity of scenario content, events/actions that occurred in the simulation, feedback delivered, and all conversations that occurred before, during, and after the simulation-based experience based on institutional policy.

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About the International Nursing Association for Clinical Simulation and Learning

The International Nursing Association for Clinical Simulation and Learning (INACSL) is the global leader in transforming practice to improve patient safety through excellence in health care simulation. INACSL is a community of practice for simulation where members can network with simulation leaders, educators, researchers, and industry partners. INACSL also provides the INACSL Standards of Best Practice: Simulation[SM], an evidence-based framework to guide simulation design, implementation, debriefing, evaluation, and research.

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Standards of Best Practice: Simulation

INACSL Standards of Best Practice: Simulation[SM] Simulation-Enhanced Interprofessional Education (Sim-IPE)

INACSL Standards Committee

KEYWORDS
interprofessional education;
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As the science of simulation continues to evolve, so does the need for additions and revisions to the INACSL Standards of Best Practice: Simulation[SM]. Therefore, the INACSL Standards of Best Practice: Simulation are living documents.

Standard

Simulation-enhanced interprofessional education (Sim-IPE)[1] enables participants from different professions to engage in a simulation-based experience to achieve shared or linked objectives and outcomes.

Background

The complex health care needs of today's society require health care professionals to work as a collaborative team. Safe, quality health care depends on the ability of the health care team to cooperate, communicate, and share skills and knowledge appropriately. Sim-IPE is the overlap of the pedagogy of simulation and interprofessional education (IPE), providing a collaborative approach for the development and mastery of interprofessional practice competencies.[2,3] Simulation-based experiences are recognized as an effective way to promote IPE teamwork.

Sim-IPE is designed for individuals to "learn about, from, and with each other to enable effective collaboration and improve health outcomes"[2] (p.31) therefore, creating opportunities for purposeful learning. Creating these rich learning opportunities can be difficult given the many natural variables present in simulation education (e.g., simulation, simulator, simulation program, curriculum, schedules, participants, and educators) that may impact learning. As a way to achieve the highest interprofessional learning that can best withstand these variables, educators should use published theories (educational, organizational, and/or management), concepts, frameworks, standards, and competencies to guide the development implementation and evaluation of Sim-IPE.[4,5]

Strategies from simulation-based education and IPE should be integrated into all aspects of the experience.

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Additionally, strategies from human factors research and team performance are essential for effective communication and collaboration in Sim-IPE.

An evaluation plan should be considered when designing a Sim-IPE activity to measure the outcome(s) of the methodology, experience, and learning outcomes to contribute to the body of science specific to Sim-IPE.[3,6] Simulation and IPE are both anecdotally linked to patient safety, but little evidence is available to validate this linkage (Sim-IPE), and most of the available tools currently lack psychometric development.[7] Research utilizing valid and reliable measures is needed to determine the effectiveness of Sim-IPE to include changes in attitudes, changes in clinical practice, and changes in patient outcomes. Educators and researchers are encouraged to disseminate outcomes from Sim-IPE experiences.

Potential consequences of not following this standard may include impaired learning opportunities, professional mistrust, ineffective working relationships, unsafe learning environments, and lack of role clarity.[8]

Criteria Necessary to Meet This Standard

1. Conduct Sim-IPE based on a theoretical or a conceptual framework.[4,5,9]
2. Utilize best practices in the design and development of Sim-IPE.
3. Recognize and address potential barriers to Sim-IPE.
4. Devise an appropriate evaluation plan for Sim-IPE.

Criterion 1: Conduct Sim-IPE based on a theoretical or a conceptual framework.[4,5,9]

Required elements:

- Include adult learning theories, frameworks, standards, and competencies to structure the development of Sim-IPE.
  - Explore teamwork or crisis resource management framework(s) with consideration to adopt for consistency.
  - Intentionally design Sim-IPE using published theoretical models, frameworks, and/or competencies (e.g., nationally accepted core competencies, certifying and accrediting bodies, professional societies).
- Conduct curricular mapping to identify potential and/or appropriate integration of Sim-IPE.
- Integrate the theoretical and philosophical models of each health care profession involved in the Sim-IPE.

Criterion 2: Utilize best practices in the design and development of Sim-IPE.

Required elements:

- Best practices for Sim-IPE should:
  - Consider multiple experiences to achieve expected outcomes.
  - Incorporate authentic,[10] challenging, reality-based activities/scenarios developed and reviewed by the professions involved in the simulation.
  - Develop mutual goals among the professions involved in the experience.
  - Base activities on learning objectives,[11] participants' knowledge, skills, needs, and experiences.
  - Ensure a safe learning environment.
  - Provide appropriate, team-based structured debriefing and feedback as appropriate for the goal of the simulation.[6,9,10,12,13]

Criterion 3: Recognize and address potential barriers to Sim-IPE.

Required elements:

- Perform a needs assessment to determine if the organization or program is ready for Sim-IPE and that stakeholders will be able to benefit.[17]
- Determine institutional and leadership commitment to Sim-IPE.[2,4,6,15]
- Address sustainability and institutional and local issues during the development, planning, and evaluation processes.
- Utilize Sim-IPE champions and stakeholders throughout the development, planning, and implementation processes.
- Review available resources including financial support, simulation space, equipment, supplies, time, and support staff/facilitators, as Sim-IPE can be resource intensive.[4,6,14,15]
- Provide initial and ongoing faculty development.[4,16-18]
- Determine the infrastructure for Sim-IPE including curricular underpinnings and development of curricula.[2,16-18]
- Provide support, including recognition and time, for educators to participate in designing, conducting, and debriefing simulation-based activities.[6,15,16,19]
- Develop the plan for sustainment after the initial startup.
- Consider that additional barriers to Sim-IPE may occur in some countries.[19]
- Follow INACSL Standard: Simulation Design and INACSL Standard: Professional Integrity.

Criterion 4: Include an appropriate evaluation plan.

Required elements:

- Use reliable and valid tools, if available.

- Develop the evaluation in consultation with experts (i.e., statisticians, researchers, or psychometricians).
- Investigate how Sim-IPE can be effectively integrated into various curricula (pre and post licensure).
- Measure how Sim-IPE impacts individual and team behavior.
- Explore how Sim-IPE can be used to develop and assess interprofessional competencies.
- Measure how Sim-IPE impacts learner outcomes.
- Measure how Sim-IPE impacts patient outcomes.[7,18]
- Measure how Sim-IPE impacts culture change.

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Decker, S., Anderson, M., Boese, T., Epps, C., McCarthy, J., Motola, I., …, & Lioce, L. (2015). Standards of best practice: Simulation standard VIII: Simulation-enhanced interprofessional education (sim-IPE). *Clinical Simulation in Nursing*, *11*(6), 293-297.

About the International Nursing Association for Clinical Simulation and Learning (INACSL)

The International Nursing Association for Clinical Simulation and Learning (INACSL) is the global leader in transforming practice to improve patient safety through excellence in health care simulation. INACSL is a community of practice for simulation where members can network with simulation leaders, educators, researchers, and industry partners. INACSL also provides the INACSL Standards of Best Practice: Simulation[SM], an evidence-based framework to guide simulation design, implementation, debriefing, evaluation, and research.

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Standards of Best Practice

INACSL Standards of Best Practice: Simulation[SM]: Operations

The INACSL Standards Committee

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As the science of simulation continues to evolve, so does the need for additions and revisions to the INACSL Standards of Best Practice: Simulation[SM]. Therefore, the INACSL Standards of Best Practice: Simulation are living documents.

Standard

All simulation-based education programs require systems and infrastructure to support and maintain operations.

Background

Simulation operations encompass the infrastructure, people, and processes necessary for implementation of an effective and efficient simulation-based education (SBE) program. The interactions of these pieces must form a system that integrates with larger educational and health care entities to realize the goals of SBE. SBE is no longer an adjunct to health care training and/or professional development programs but an all-inclusive integrated program requiring business acumen and technically knowledgeable personnel that serve as team members providing leadership and support in the delivery of SBE. The required knowledge, skills, and attributes to implement evidence-based best practices for simulation experiences are evolving rapidly.[1-3] These skills may be possessed by an individual or shared among a team. Specialists with business, education, and technical skills promote growth, sustainability, fidelity, and achievement of goals and outcomes.[4] The need for defining simulation operations goes beyond any role or title. Successful simulation operations are curated as dynamic collaborations among leaders, educators, learners, and adaptive relationships between departments.

SBE operations begin with a strategic plan which creates the structure and defines the function for a SBE program.[5] The guiding principle of this plan aligns with the program mission. The needs of the SBE program's stakeholders are

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supported by this strategic plan.[6] A complete strategic plan has realistic goals and fits within the organization's capacity for implementation.[7] This plan also provides a foundation from which progress can be measured and establishes a mechanism for informing change when needed. This document creates a shared understanding that outlines the beginning state, desired outcomes, activities to meet those outcomes, and evaluation metrics to document outcomes of the SBE program.

Personnel and financial resources are also an integral part of SBE programs. The largest barriers to growth in simulation centers worldwide is lack of financial support and technical (operations) staff.[8-10] The National Council of State Boards of Nursing study found that dedicated, trained simulation personnel are necessary to ensure consistent and reproducible SBE outcomes.[2] With formal simulation education beginning to materialize,[11-13] it is necessary to recognize formal simulation education and training as the preferred requirement for hire; however, personnel with on-the-job training and relevant prior experience can be substituted when competency and proficiency can be demonstrated.[14] The SBE program must also budget for, and use, appropriate fidelity, space, equipment, resources, and the expertise necessary to operate and meet all facets of the program.[4,15]

The SBE budget and human resource requirements must foster and support expertise and professional development of SBE personnel. Proficiency, competency, and expertise in SBE[6,16,17] pedagogy leads to improved outcomes in the regional and/or global delivery of health care.[18] Well-designed SBE programs require a large investment of money, resources and time, often with limited capacity to yield equal immediate monetary return on investment.[19,20] Ultimately, the goal is improved competency metrics among novice learners, clinicians transitioning to practice, licensed clinicians engaging in continuing education, and a positive effect on patient outcomes.

As the evolution of SBE programs continues, administration, education, coordination, and technical implementation must be addressed.[6,18,21,22] Written policies and procedures will define role delineation, job requirements, accountability, safety, contingency, effectiveness, and efficiency,[23,24] while intentional systems integration will bring together multiple potentially disparate groups to achieve a common goal for a SBE program. These processes are continually evolving, requiring management and business knowledge to successfully support the needs of the SBE program, key stakeholders, and affected health care systems.[25-27]

Potential consequences of not following this standard place programs at risk of not achieving SBE strategic goals and objectives. If expertise is not efficiently used or not accurately recognized, programs may fail to create an effective and efficient SBE program. If fiscal appropriations cannot meet the strategic needs of the SBE program, sustainability will also be at risk and/or growth stifled.

Criteria Necessary to Meet This Standard

1. Implement a strategic plan that coordinates and aligns resources of the SBE program to achieve its goals.
2. Provide personnel with appropriate expertise to support and sustain the SBE program.
3. Use a system to manage space, equipment, and personnel resources.
4. Maintain and manage the financial resources to support stability, sustainability, and growth of the SBE program's goals and outcomes.
5. Use a formal process for effective systems integration.
6. Create policies and procedures to support and sustain the SBE program.

Criterion 1: Implement a strategic plan that coordinates and aligns resources of the SBE program to achieve its goals.

Required Elements:

- ○ Define a strategic plan independent of the governing institution, if one exists, that supports the mission and vision of the SBE program and larger organization.[5,6]
- ○ Develop plans for
  - Immediate strategic goals (less than a year)
  - Short-term strategic goals (1-2 years)
  - Long-term strategic goals (3-5 years)
- ○ Use an organizational chart that supports the goals and outcomes of the SBE program, identifying, at a minimum, roles for[20]
  - Simulation leadership
  - Simulation operations
  - Simulation education
- ○ Involve key stakeholders in the strategic planning process.[17,24,28]
- ○ Incorporate an ongoing professional development plan for simulation personnel with associated competency validation (see also criterion 2).[2,6,17,23,29]
  - Development plan should be program and personnel specific to meet identified needs and may include such things as
    - ■ Attendance at local, regional, and/or national conferences
    - ■ Completing online or in-person SBE-focused courses
    - ■ Joining regional networks to share resources and skills
- ○ Implement a systematic plan for evaluation, with a prescribed review/revision cycle, allowing for more frequent review and/or revision as evidence, regulation, and/or programmatic changes occur; including ongoing review of simulation literature for best practices.[29-31]
- ○ Articulate the value proposition or return on investment of the simulation program.[19,20]

- Identify justifiable capital expenditures including[4,15]
  - Facility improvements and expansion
  - SBE equipment
  - Durable medical equipment
- Plan to replace assets that have exhausted their useful life
- Use a communication plan to report the progress of the strategic goals to key stakeholders.[5,32-34]

Criterion 2: Provide personnel with appropriate expertise to support and sustain the SBE program.

Required Elements:

- Design job descriptions for the SBE program that align with the organizational structure.
- Articulate scope of practice, educational requirements, and compensation for each role.
- Ensure that personnel can meet the job skills, or be trained to meet expectations, as part of the hiring and ongoing employment processes.[2,35]
- Accurately portray responsibilities within the SBE program. These roles may be held by one or more persons even with different titles:
  - Implementation role responsibilities may include[10]:
    - Audiovisual
    - Information technology/systems
    - Manikin operation and programming
    - Standardized/simulated patient coordination, communication, and portrayal
    - Manages and maintains schedule
    - Set up/break down of simulated environment
    - Moulage
    - Data collection
    - Creation, manipulation, and revision of graphic and video content
  - Leadership, administrative, and/or management role responsibilities may include
    - Policy and procedure creation, oversight, revision, and enforcement
    - Program oversight and management of daily operations
    - Liaison with stakeholders[36]
    - Coordination of personnel and resources
    - Training
    - Hiring/firing
    - Onboarding
    - Ordering of supplies and capital equipment
    - Budget planning and oversight
    - Strategic planning
  - When education, credentialing, and competency are validated, personnel, regardless of title, may be extended responsibility for[2]:
    - Scenario design and development
    - Implementation and facilitation
    - Evaluation
    - Debriefing
- Provide trained personnel with capabilities to set up, operate, and maintain equipment to meet the simulation-based objectives. This must include competency with the following, as appropriate for their job description[6,7]:
  - Computer networking and connection of simulation IT infrastructure
  - Audiovisual systems
  - Operation and troubleshooting of simulation typologies and modalities as they advance
  - Costuming and moulage
  - Media file usage, manipulation, access, storage, security, and destruction
  - Staging, scripting, and use of props
  - Simulation educational purpose and teaching methods
  - Applicable health care equipment and terminology
  - Implementation and training of standardized/simulated patients as appropriate for their program
  - Initial and ongoing development of skills for the simulation program as determined by needs assessment

Criterion 3: Use a system to manage space, equipment, and personnel resources.

Required Elements:

- Identify roles, tasks, and expectations for the set up and break down of simulation-based activities (see INACSL Standard: Simulation Design).
- Maintain a competency-based training program for personnel to operate applicable equipment,[17,28,37] which may include
  - Beds/examination tables, headwalls, patient monitors, and other health care equipment
  - Computer systems
  - Medication dispensing systems
  - Phone systems
  - Vital sign monitors
  - Task trainers
  - Manikins
  - Audiovisual or debriefing systems
  - Virtual reality or augmented reality training systems
  - Surgical/procedural simulators
  - Computer-based training programs
  - 3D printers
  - Electronic health records, documentation, and order entry programs
  - All additional simulation-specific equipment
- Follow a written plan addressing the educational objective(s)/purpose(s) with an accessible list of supplies, equipment, and personnel required to support the activity (see INACSL Standard: Simulation Design)
  - All simulation-based activities must be piloted before implementation.[38-40]
  - Written scenario instructions must include expected time to set up, run, brief or prebrief, debrief and breakdown each simulation-based activity.

- Adequate time must be accounted for and planned for training of standardized/simulated patients as appropriate.[41]
- Coordinate and plan transitions between sessions to minimize downtime.[42]

○ Use a scheduled or periodic review process to ensure all simulation-based activities are feasible and appropriately designed based on programmatic resources.
- Incorporate outcomes data, participant, facilitator, and staff feedback into this review process.[5,30]

○ Have a system and/or process and policy to prioritize requests, reserve rooms, equipment, and ensure personnel are available to operate and support each simulation-based activity.

○ Use an inventory control system to manage purchasing, shipping and receiving, tracking, storage, and reordering of equipment and supplies.

○ Ensure all SBE experiences and associated activities are in an environment that complies with institutional, national, international, or other regulatory occupational safety practices.[43,44] For example:
- Ventilation, if working with fumes or gases
- Using correct ergonomic techniques for lifting heavy equipment to prevent injury
- Prevention, identification, and reporting of needle sticks and other injuries

Criterion 4: Maintain and manage the financial resources to support stability, sustainability, and growth of the SBE program's goals and outcomes.

Required Elements:

○ Sustain a defined SBE budget with a quantified, formalized plan to analyze and control costs.[45-47]

○ Plan an operating budget for the program's revenues and expenses on a year-to-year basis.
- Consider program activities that may generate revenues through
  - Continuing education programs
  - Providing services to external clients
  - Donors, stakeholders, partnerships, alliances, grants, or loans[48]

○ Prepare and execute an operational budget in consideration of the organization and the SBE program's environmental review, current and future goals/objectives, and priorities.[34]
- Identify fixed costs that do not change regardless of the number of simulations conducted.
  - For example, facility overhead, maintenance and service contracts, personnel, and professional development for all permanent staff.
- Identify variable costs that change based on the number of SBE activities and participants.
  - For example, staffing for SBE activities such as the number of facilitators for debriefing, operations/technology specialists, standardized/simulated patients, and consumable items such as clinical and office supplies.
- Incorporate the costs of identified capital expenditures from the strategic plan as a budgeted line item (see criterion 1).
- Forecast for personnel roles and responsibilities, including professional development needs required to meet the SBE program's future participant outcomes, program objectives, and regulations.
  - Include workload, position and salary equity, job description, role expectations, and scope of practice in the forecast.

○ Report the correlation of the impact of SBE program metrics on the organization's costs and/or savings from, at a minimum, the following domains:[49-52]
- Educational effectiveness
- Educational efficiency
- Resource management
- Patient safety
- Quality of care
- New employment efficacy

Criterion 5: Use a formal process for effective systems integration.

Required Elements:

○ Direct the program's simulation activities by the strategic needs of the larger organization.[27]

○ Develop the program's mission and/or vision along with written policies and procedures to articulate the role of the SBE program in relation to other stakeholders and the larger organization or region.

○ Communicate with stakeholders about how the SBE program's mission, vision, and goals align with the overall improvement of health care education and eventually health care delivery.[27,53-55]
- SBE programs have access to and incorporate identified key performance indicators to improve simulation-based learning experiences related to outcomes.[53]

○ Actively participate and collaborate in bidirectional initiatives across organizations, contributing to the improvement of participant, health care, and/or program outcomes.[27]
- The SBE program is used by various groups to address quality, patient safety, interprofessional education, research, and risk management for the improvement of system activities.

○ Ensure ongoing systematic and programmatic improvement processes are in place for the SBE programs, including [27,30,53,54,56]
- Quality/performance improvement, dissemination, and sustainability plan(s) exist and are used

- Clearly defined metrics using consistent data collection methods
- Appropriate resources (e.g., human factors, systems engineering, psychometric, and informatics) are available to meet expected program goals.

Criterion 6: Create policies and procedures to support and sustain the SBE program.

Required Elements:

- Consider and incorporate human resource factors regardless of employment status (e.g., full-time, adjunct, volunteer, student, etc.) such as
  - Workload and compensation equity are supported by the funding entity
  - Comparable educational, credentialing, and competency requirements for the role(s) undertaken
  - Planned and unplanned personnel leave are accounted for
  - Ongoing competency and proficiency validation for all SBE personnel[2]
  - An expectation that applicable standards of best practice for simulation will be followed[2]
- Identify how prior experience and nonformal training are recognized, appraised, and viewed while making employment and advancement decisions.
- Define data collection, storage, access, destruction, and reporting processes such that it is performed and aligns with institutional and accrediting bodies' expectations.
- Describe safe management of supplies including how they are handled, secured, stored, and maintained. These may be supported by institutional, national, international, or other regulatory protocols as appropriate.[27] Examples include
  - Solvents
  - Moulage supplies and materials
  - Expired and simulated medications
  - Defibrillators
  - Sharp containers
- Provide safety information for any chemical, medication, or other hazardous supplies and how they can be accessed by personnel.
  - For example—In the United States, Safety Data Sheets [57] for applicable materials, or in Canada, Workplace Hazardous Materials Information System (WHMIS).[58]
- Create clear guidelines that
  - Address duplicated, conflicting, and/or confusing requests.
  - Prioritize the use of space, equipment, and personnel.
  - Establish deadlines for scheduling based on prioritization of use.
  - Identify reorder points for consumable resources.
- Specify guidelines for equipment storage, locations, security, and access, including
  - Use and maintenance of simulation equipment
  - Planned downtime and periodic maintenance schedules
  - How user and system manuals for simulation equipment are to be maintained and organized
- Establish audiovisual capture, retention, and use policies
  - Policies may be variable by the type of activity and planned use but must be consistent and delineated
  - Confidentiality
  - Articulate psychological safety and learner expectations for learning activities
  - Establish contingency plans for unanticipated events, participant accommodations, or simulator downtime, etc.

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About the International Nursing Association for Clinical Simulation and Learning

The International Nursing Association for Clinical Simulation and Learning (INACSL) is the global leader in transforming practice to improve patient safety through excellence in health care simulation. INACSL is a community of practice for simulation where members can network with simulation leaders, educators, researchers, and industry partners. INACSL also provides the INACSL Standards of Best Practice: Simulation℠, an evidence-based framework to guide simulation design, implementation, debriefing, evaluation, and research.

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Standards of Best Practice: Simulation

INACSL Standards of Best Practice: Simulation[SM] Simulation Glossary

INACSL Standards Committee

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As the science of simulation continues to evolve, so does the need for additions and revisions to the INACSL Standards of Best Practice: Simulation[SM]. Therefore, the INACSL Standards of Best Practice: Simulation are living documents.

Simulation Glossary Statement

Consistent terminology provides guidance and clear communication and reflects shared values in simulation experiences, research, and publications. Knowledge and ideas are clearly communicated with consistent terminology to advance the science of simulation.

Background

Standardized terminology enhances understanding and communication among planners, participants, and others involved in simulation-based experiences (SBEs), regardless of the simulation environment. Thus, standardization of simulation terminology promotes consistency in education, practice, research, and publication.

The definitions in the INACSL Simulation Glossary correspond to the INACSL Standards of Best Practice: Simulation[SM] and are designed to explain the meaning of terms in the Standards. Although there may be some definitions in the Simulation Glossary that are also in the Healthcare Simulation Dictionary (e.g., Avatar), use of these definitions in the INACSL Standards of Best Practice: Simulation[SM] is important.[1]

Potential consequences of not using the Simulation Glossary may be: confusion, miscommunication, misunderstanding, and/or inability to achieve intended objectives and expected outcomes of SBEs.

Terms

Affective

Refers to a domain of learning that involves attitudes, beliefs, values, feelings, and emotions. Classification of this domain of learning is hierarchal where learning occurs along a continuum of stages related to internal personal and professional growth.[2-5]

Assessment

Refers to processes that provide information about or feedback about individual participants, groups, or programs.

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Specifically, assessment refers to observations of progress related to knowledge, skills, and attitudes (KSA). Findings of assessment are used to improve future outcomes.[5]

Avatar

A graphical representation, typically three dimensional, of a person capable of relatively complex actions including facial expression and physical responses while participating in a virtual SBE. The user controls the avatar through the use of a mouse, keyboard, or a type of joystick to move through the virtual SBE.[1,6]

Backstory

A narrative, which provides a history and/or background and is created for a fictional character(s) and/or about a situation for a SBE.[7]

Clinical

Pertaining to an actual or SBE related to the care of individuals, families, or groups in health care settings, which permits opportunities for application of KSA.[8,9]

Clinical Judgment

The art of making a series of decisions to determine whether to take action based on various types of knowledge. The individual recognizes changes and salient aspects in a clinical situation, interprets their meaning, responds appropriately, and reflects on the effectiveness of the intervention. Clinical judgment is influenced by the individual's previous experiences, problem-solving, critical-thinking, and clinical-reasoning abilities. See Figure.[10-14]

Clinical Reasoning

A process that involves both thinking (cognition) and reflective thinking (metacognition) to gather and comprehend data while recalling knowledge, skills (technical and nontechnical), and attitudes about a situation as it unfolds. After analysis, information is put together into meaningful conclusions to determine alternative actions. See Figure.[15-20]

Coaching

A method of directing or instructing a person or group of people in order to achieve a goal or goals, develop a specific skill or skills, or develop a competency or competencies.[8,9]

Cognitive

Refers to a domain of learning that includes knowledge, comprehension, application, analysis, synthesis, and evaluation. The goal of learning in this domain is to help participants progress to higher levels of learning so they are able to make judgments about the subject at hand.[2,5]

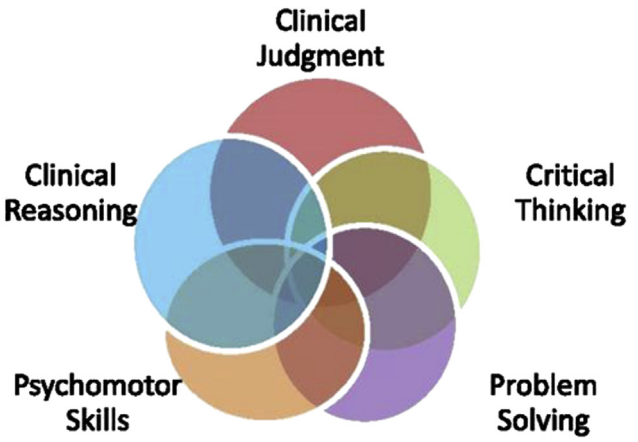

Figure Skill Development and Clinical Judgment©. This figure, developed by the International Nursing Association for Clinical Simulation and Learning, reflects the complexity of skill development necessary to progress from more basic skills to the higher-level clinical judgment and reasoning ability used in decision-making for safe, effective practice. All levels of development are interrelated; therefore, they interact and affect one another.

Competence

Demonstrates the ability to perform a specific role or skill based on standardized criteria. Individuals having the state or quality of being adequately or well qualified to do a job properly. The criteria may include a set of defined behaviors that guide the identification, development, and evaluation of one's ability to perform a specific role.[21]

Computer-Based Simulation (Also Known as Computer-Assisted Simulation, Virtual Reality)

A simulation-based learning activity designed to provide an experience through the use of an alternative medium. Learners can complete specific tasks in a variety of potential environments, use information to provide assessment and care, make clinical decisions, and observe the results in action. Feedback can be provided during and after the interaction.[22]

Concept Mapping

A teaching strategy or method of visualizing relationships among various concepts. It includes a branching, hierarchical diagram of concepts showing how they are connected using arrows and labels to identify interrelationships.[23]

Constructivism

Philosophical theory of learning that views knowledge as something that individuals create for themselves through

their interaction with their environment. In constructivism, learning is a process of discovery whereby the learner seeks to understand issues, which guide the discovery process that is personally relevant. Simulation is based on constructivist theories.[24]

Critical Thinking

A disciplined process that requires validation of data, including any assumptions that may influence thoughts and actions and then careful reflection on the entire process while evaluating the effectiveness of what has been determined as the necessary action(s) to take. This process entails purposeful, goal-directed thinking and is based on scientific principles and methods (evidence) rather than assumptions or conjecture. See Figure.[12,25,26]

Cue (Also Known as Prompts)

Information provided that helps the participant(s) process and progress through the scenario to achieve stated objectives. Cueing comprises two types, conceptual and reality cues, with mode of delivery enacted via equipment, environment, or patient and role characters. Conceptual cues provide the learner with information to achieve expected outcomes in a SBE. Reality cues help the learner interpret or clarify simulated reality through information delivered by the simulated patient or role characters.[27,28]

Debriefing

A reflective process immediately following the SBE that is led by a trained facilitator using an evidence-based debriefing model. Participants' reflective thinking is encouraged, and feedback is provided regarding the participants' performance while various aspects of the completed simulation are discussed. Participants are encouraged to explore emotions and question, reflect, and provide feedback to one another. The purpose of debriefing is to move toward assimilation and accommodation to transfer learning to future situations.[27,29]

Decision-Making

An outcome of mental processes (cognitive process) leading to the selection of a course of action from among several alternatives.[8,9]

Diversity

A concept, which includes an understanding of the uniqueness of individuals as well as a recognition of the differences among people. Dimensions of diversity include race, ethnicity, gender, age, religion, socioeconomic status, physical ability or disability, sexual orientation as well as religious, political, or other beliefs.[30-32]

Domains of Learning

> … three separate, yet interdependent components of learning outcomes achievable by human learners. These domains: cognitive, affective, and psychomotor, represent various categories and levels of learning complexity and are commonly referred to as educational taxonomies.
>
> —See Table.[3,4,33,34]

Embedded Participant (Also Known as Scenario Guide, Scenario Role Player, Actor, or Confederate)

A role assigned in a simulation encounter to help guide the scenario. The guidance may be positive, negative, or neutral or as a distracter, depending on the objective(s), the level of the participants, and the scenario. Although the embedded participant's role is part of the situation, the underlying purpose of the role may not be revealed to the participants in the scenario or simulation.[1]

Evaluation

A broad term for appraising data or placing a value on data gathered through one or more measurements. It involves rendering a judgment including strengths and weaknesses. Evaluation measures quality and productivity against a standard of performance.[35] Evaluation may be formative, summative, high stakes, or related to the simulation program or process.

Formative Evaluation

Evaluation wherein the facilitator's focus is on the participant's progress toward goal attainment through preset criteria; a process for an individual or group engaged in a simulation activity for the purpose of providing constructive feedback for that individual or group to improve.[5,27]

Summative Evaluation

Evaluation at the end of a learning period or at a discrete point in time in which participants are provided with feedback about their achievement of outcome through preset criteria; a process for determining the competence of a participant engaged in health care activity. The assessment of achievement of outcome criteria may be associated with an assigned grade.[5,27]

High-Stakes Evaluation

An evaluation process associated with a simulation activity that has a major academic, educational, or employment consequence (such as a grading decision, including pass or fail implications; a decision regarding competency, merit pay, promotion, or certification) at a discrete point in time.[36] High stakes refer to the outcome or consequences of the process.

Table Comparison of Bloom's Original (1956) and Bloom's Revised (2001) Taxonomies with Quality and Safety Education for Nurses Competencies and Knowledge, Skills, and Attitudes (KSA)

Domains of Learning	Knowledge Dimension	Quality and Safety Education for Nurses (QSEN) Competencies
Original Bloom's Taxonomy (QSEN, 2014)	Revised Bloom's Taxonomy (Bloom, 1956)	The Quality and Safety Education for Nurses (QSEN) Project (Bloom, 1956; QSEN, 2014; Williamson & Harrison, 2010)
Cognitive	Factual knowledge Conceptual knowledge	Knowledge
Psychomotor	Procedural knowledge	Skills
Affective	Metacognitive knowledge	Attitudes

Program or Process Evaluation
A systematic collection of information about the activities, characteristics, and outcomes of SBEs to make judgments about the program, improve or further program effectiveness, increase understanding, and inform decisions about future programming.[37] Specifically, the process includes an appraisal of the participant(s), facilitator(s), the SBE, the facility, and the support team.

Facilitation

A method and strategy that occurs throughout (before, during, and after) SBEs in which a person helps to bring about an outcome(s) by providing guidance.[38]

Facilitator

A trained individual who provides guidance, support, and structure at some or all stages of simulation-based learning including prebriefing, simulation, and/or debriefing.[8,9]

Feedback

Information given or dialog between participants, facilitator, simulator, or peer with the intention of improving the understanding of concepts or aspects of performance.[38]

Fiction Contract

The implicit or explicit agreement among participants and facilitator(s) about how the participant is expected to interact with the simulated situation and how the facilitators will treat that interaction.[39]

Fidelity

The ability to view or represent things as they are to enhance believability.[1] The degree to which a simulated experience approaches reality; as fidelity increases, realism increases. The level of fidelity is determined by the environment, the tools and resources used, and many factors associated with the participants. Fidelity can involve a variety of dimensions:

Conceptual Fidelity
Ensures all elements of the scenario or case relate to each other in a realistic way, so that the case makes sense to the learners (e.g., vital signs reflect the diagnosis).[1]

Physical/Environmental Fidelity
Factors such as environment, manikins, room, moulage, equipment, noise, and/or props.[40]

Psychological Fidelity
Factors such as emotions, beliefs, and self-awareness of participants; the extent to which the simulated environment evokes the underlying psychological processes that are necessary in the real-world setting for the participant. The degree of perceived realism, including psychological factors such as emotions, beliefs, and self-awareness of participants in simulation scenarios.[40]

Frame(s)

The invisible "lens" through which individuals interpret new information and experiences for the purpose of making meaning from the new experience. Frames are formed through previous experiences and can be based on knowledge, attitudes, feelings, goals, rules, and/or perceptions; the internal participant or facilitator mindset; knowledge, thoughts, feelings, actions (speech/body language), attitudes (verbal/nonverbal), and perceptions.[41,42]

Haptic Device

Computer technology, generally three dimensional in nature, that integrates proprioception (touch) to allow the participant(s) to interact with and control the virtual equipment based on feedback from the system. Haptics can be used to simulate touching; palpating an organ or body part; and/or cutting, tearing, or applying traction on tissue such as when using simulated virtual chest tube or virtual intravenous insertion systems. Participant decision-

making is greatly influenced by the feedback received from the system.[1,43]

Hybrid Simulation

The use of two or more modalities of simulation modalities to enhance the fidelity of a scenario by integrating the environment, physiology, emotions, and dialog of a real patient encounter. For example, the use of a manikin to represent the patient, while the embedded participant assumes the role of the patient's voice or takes on the role of a distraught family member.[1,44]

In Situ

A SBE conducted in the actual patient care area/setting in which the health care providers would normally function in order to achieve a high level of fidelity.[1,45-47]

Interprofessional Education

When students [or healthcare professionals] from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes.[48]

Intervention Fidelity

Refers to the adherence and delivery of a research plan as designed. Any variation from the design must be addressed.[49-53]

Knowledge, Skills, Attitudes (KSA)

Acronym for knowledge, skills, and attitudes necessary to continuously improve the quality and safety of the health care systems within which individuals work.[34]

Knowledge
The awareness, understanding, and expertise an individual acquires through experience or education.

Skills
Ability acquired through deliberate practice and sustained efforts to carry out activities.

Attitudes
A tendency to respond positively or negatively toward an idea, an individual, or situation.

Life Savers

A methodology to manage unexpected events that occur during SBEs. Plans may be determined before and/or interventions may occur spontaneously during scenarios that allow participants to complete the simulation.[54]

Modality

A term used to refer to the type(s) of simulation being used as part of the simulation activity, for example, task trainers, manikin based, standardized/simulated patients, computer based, virtual reality, and hybrid.[1]

Moulage

The technique of creating simulated wounds, injuries, diseases, the aging processes, and other physical characteristics specific to a scenario. Moulage supports the sensory perceptions of participants and supports the fidelity of the simulation scenario through the use of makeup, attachable artifacts (e.g., penetrating objects), and smells.[55,56]

Needs Assessment

A systematic process of identifying gaps in knowledge, skills, or attitudes of the learner.[57]

Objective

Statements of specific measurable results that participants are expected to achieve during a SBE. Statements may encompass cognitive (knowledge), affective (attitude), or psychomotor (skills) domains of learning that match the learners' level of knowledge and experience.[58-60]

Outcome

Measurable results of the participants' progress toward meeting a set of objectives. Expected outcomes are the change in knowledge, skills, or attitudes as a result of the simulation experience.[8,9]

Participant

One who engages in a simulation-based activity for the purpose of gaining or demonstrating mastery of KSA of professional practice.[8]

Prebriefing

An information or orientation session immediately prior to the start of a SBE in which instructions or preparatory information is given to the participants. The purpose of prebriefing is to establish a psychologically safe environment for participants.[61] Suggested activities include reviewing objectives; creating a "fiction contract"; and orienting participants to the equipment, environment, mannequin, roles, time allotment, and scenario.

Procedural Simulation

The use of a simulation modality (e.g., task trainer, manikin, computer) to assist in the process of learning to

complete a technical skill(s), or a procedure, which is a series of steps taken to accomplish an end.[1]

Problem Solving

Refers to the process of selectively attending to information in the patient care setting, using existing knowledge and collecting pertinent data to formulate a solution. This complex process requires different cognitive processes, including methods of reasoning and strategizing, in order to manage a situation.[62]

Professional Boundaries

Clear and defined limits which are established to maintain effective and appropriate interactions/behaviors among all participants involved with a SBE.[63]

Professional Integrity

A trait exhibited by one's ability to consistently and willingly practice within the guidelines of the code of ethics of a chosen profession.[64-66]

Prompt (Also Known as Cue)

A hint or clue given to a participant in a scenario.

Psychomotor

Refers to a domain of learning involving skills required in an area of professional practice.[67]

Psychomotor Skill

The ability to carry out kinesthetic or physical movement efficiently and effectively, with speed and accuracy. Psychomotor skill is more than the ability to perform; it includes the ability to perform proficiently, smoothly, and consistently under varying conditions and within appropriate time limits.[67] See Figure.

Quality and Safety Education for Nurses

Quality and safety education for nurses are defined as quality and safety competencies for nursing. The overall goal of quality and safety education for nurses addresses the challenge of preparing nurses utilizing the attributes of KSA necessary to continuously improve the quality and safety of the health care systems in which they work.[2] See Table.

Reflective Thinking

The engagement of self-monitoring that occurs during or after a simulation experience. Considered an essential component of experiential learning, it promotes the discovery of new knowledge with the intent of applying this knowledge to future situations. Reflective thinking is necessary for metacognitive skill acquisition and clinical judgment and has the potential to decrease the gap between theory and practice. Reflection requires creativity and conscious self-evaluation to deal with unique patient situations.[68-75]

Reliability

The consistency of a measurement or the degree to which an instrument measures in the same way each time it is used under the same conditions with the same participants. It is the repeatability of a measurement. A measurement is considered reliable if a person's scores on the same test given twice are similar. Reliability can be determined by a test retest method or by testing for internal consistency.[8,9]

Role

A responsibility or character assumed in a SBE.[8,9]

Safe Learning Environment

The emotional climate that is created through the interaction among all participants (including facilitators). In this positive emotional climate, all participants feel at ease taking risks, making mistakes, or extending themselves beyond their comfort zone. Awareness of the psychological aspects of learning, the effects of unintentional bias, cultural differences, and attentiveness to one's own state of mind helps to effectively create a safe environment.[8]

Scenario

A deliberately designed simulation experience (also known as a case), that provides participants with an opportunity to meet identified objectives. The scenario provides a context for the simulation and can vary in length and complexity, depending on the objectives.[59,61,76-78]

Self-Efficacy

An individual's perception or belief in his or her ability to achieve. This may be reflected in how an individual behaves and/or performs.[79]

Simulation

An educational strategy in which a particular set of conditions are created or replicated to resemble authentic situations that are possible in real life. Simulation can incorporate one or more modalities to promote, improve, or validate a participant's performance.[80]

Simulation-Based Experience(s)

A broad array of structured activities that represent actual or potential situations in education, practice, and research. These activities allow participants to develop or enhance knowledge, skills, and/or attitudes and provide an opportunity to analyze and respond to realistic situations in a simulated environment.[81]

Simulated Clinical Immersion

A planned SBE in which participants are engrossed in a situation or setting as they would be if they were in the real world. The goal is to evoke or replicate life-like aspects in a fully interactive fashion.[82]

Simulation-Enhanced Interprofessional Experience

Simulation-based activities in which participants and facilitators from two or more professions are placed into a simulated health care experience in which "… shared or linked educational goals are pursued,[83] while the individuals involved "learn from, about, and with each other to enable effective collaboration and improve health outcomes".[84]

Standardized Patient (Also Known as Simulated Patient)

A person trained to consistently portray a patient or other individual in a scripted scenario for the purposes of instruction, practice, or evaluation.[1,85]

Validity

The degree to which a test or evaluation tool accurately measures the intended concept of interest.[8,9]

Virtual Reality (Also Known as Computer-Assisted Simulation, Computer-Based Simulation)

A computer-generated reality, which allows a learner or group of learners to experience various auditory and visual stimuli. This reality can be experienced through the use of specialized ear and eyewear.[1,86]

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About the International Nursing Association for Clinical Simulation and Learning

The International Nursing Association for Clinical Simulation and Learning (INACSL) is the global leader in transforming practice to improve patient safety through excellence in health care simulation. INACSL is a community of practice for simulation where members can network with simulation leaders, educators, researchers, and industry partners. INACSL also provides the INACSL Standards of Best Practice: Simulation[SM], an evidence-based framework to guide simulation design, implementation, debriefing, evaluation, and research.

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Standards of Best Practice: Simulation[SM]

Standards

The International Nursing Association for Clinical Simulation and Learning (INACSL) is the global leader in transforming practice to improve patient safety through excellence in health care simulation. INACSL is a community of practice for simulation where members can network with simulation leaders, educators, researchers, and industry partners. INACSL also provides the INACSL Standards of Best Practice: Simulation[SM], an evidence-based framework to guide simulation design, implementation, debriefing, evaluation, and research. These Standards provide the foundation for evidence-based practice in academia, practice, and research and reinforce simulation as state-of-the science teaching and learning strategies. Following are the components of the INACSL Standards of Best Practice: Simulation[SM].

Standard

Policies established by consensus and approved by a recognized body that provides criteria and required elements aimed at achieving simulation outcomes adapted from the International Organization for Standardization (ISO, 2004). The INACSL Standards of Best Practice in Simulation[SM] include background, criteria, and required elements.

Background

Literature support and rationale for the Standard. Includes potential consequences of not adhering to the standard criteria and required elements.

Criteria

Factors such as attributes, characteristics, and/or parameters necessary to meet the required elements of the Standard.

Required Elements

Required procedures or principles based on current evidence-based practice that are necessary to meet the criteria for the Standard.

This edition of the INACSL Standard of Best Practice: Simulation[SM] includes:

- Simulation Design
- Outcomes and Objectives
- Facilitation
- Debriefing
- Participant Evaluation
- Professional Integrity
- Simulation-Enhanced Interprofessional Education
- Simulation Glossary

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