Simulation: Integrating interactive learning experiences into the nursing curriculum

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Welcome!

Photo Credit: http://www.traveltop.net/wp-content/uploads/2012/05/banff-national-park-alberta-canada1.jpg
Disclosure

Suzanne Hetzel Campbell PhD, RN, IBCLC


• Royalty Jones & Bartlett Learning, Co-editor Core Curriculum for Interdisciplinary Lactation Care, 2018.

• Sit on Editorial Board of Clinical Simulation in Nursing

• Sit on Advisory Board of LiquidGoldConcept, Inc.

• Sit on Board of Directors of CanHealth International

• Canadian Association of Schools of Nursing (CASN/ACESI) Course Instructor, Canadian Simulation Nurse Educator Certification Program (Modules 2 & 3)

• I do not intend to discuss an unapproved/investigative use of a commercial product/device in my presentation
Objectives

• Share a “state-of-the-science” perspective to identify synergies for your program planning
• Differentiate the use of simulation for technical and non-technical learning: clinical skill, teamwork, conflict resolution, leadership and role development;
• Review health professional educations use of simulation;
• Analyze the substitution of clinical practice with other methods of learning (on-campus vs off-campus);
• Examine how simulation is being standardized and evaluated; and
• Compare and contrast the advantages and challenges of integrating simulation into the curriculum.

"Health is about people: the core driving purpose of professional education must be to enhance the performance of health systems for meeting the needs of patients and populations in an equitable and efficient manner."

INSTITUTE OF MEDICINE of the National Academies
Education of Health Professionals for the 21st Century (2010)

Health Professionals for a New Century: Transforming Education to Strengthen Health Systems in an Interdependent World*

A Global Independent Commission

- Educate all health professionals:
  - as members of interdisciplinary teams,
  - emphasizing evidence-based practice,
  - quality improvement approaches, and
  - informatics

Top 10 Changes in Nursing in last ½ Century! (Barron McBride, 2011, p. 166-167)

1. **Nursing not one kind of job** (leadership not discipline specific)
2. Growing global acceptance that **nursing leadership is necessary** for development of safe practice environments, quality care
3. **Informatics revolution** – practice, research, education – not time or place bound
4. Emphasis now on **OUTCOMES** (rather than process) – decision making requires data
5. **Centers of nursing excellence** -> consortium arrangements across institutional boundaries
6. **Research base of nursing visible** – doctoral programs, post-doctoral training, institutes of nursing research, research societies
7. **Advanced-practice nursing** established at graduate level – accepted by public, specialties, and certification
8. Nursing students – **diverse age, gender, race, learning style** --- better reflecting the population served
9. **Articulation** across levels of nursing increasingly possible and user-friendly
10. **Nursing literature and infrastructure** greatly expanded – journals, standards, competencies, and policy statements
Paradigm Shift in Nursing Education

• Effective use of nurses based on their levels of
  – Knowledge
  – Education
  – Skills

• Configuration of the nursing workforce – succession planning

• Enhancing the knowledge base of nursing to bring it in line with other professions (BSN)
WHO Collaborative Practice Learning Domains

• Teamwork
• Roles and responsibilities
• Communication
• Learning and critical reflection
• Relationships with and recognizing the needs of the patient
• Ethical practice

Evolving Use of Simulation

- Photo wooden horse simulator & NASA

Across industries, simulation technologies have evolved from World War I (wooden horse simulator) to latest aircraft simulators being used by NASA.
Modern era of simulation technology in health care – 1960’s Norway!

• Bjorn Lind – a Norwegian anesthesiologist persuaded Asmund Laerdal, to make Resusci-Anne – CPR mannequin (1960s)

• Earlier 1874 advocates for use of skeletons in Schools of Nursing

• 1906 – Mrs. Chase (Hartford Hospital, SoN, Connecticut US) full-body static mannequin for practicing injections/procedures
Prevalence of Simulation Globally

Courtesy Foisy-Doll & Leighton, SCORS presentation 2017, slide 6
Simulation Statistics

• NCSBN Study - NCSBN conducted a landmark, national, multi-site, longitudinal study of simulation use in prelicensure nursing programs throughout the country. Collaborating with learning institutions across the U.S., NCSBN embarked on a research initiative exploring the role and outcomes of simulation in pre-licensure clinical nursing education.

• The study provides substantial evidence that up to 50% simulation can be effectively substituted for traditional clinical experience in all prelicensure core nursing courses under conditions comparable to those described in the study.

https://www.ncsbn.org/685.htm
Simulation vs Case-Based Learning

• Similarities:
  – Identify objectives for learning
  – Provide a beginning “story” with key information
  – Focus on critical thinking
  – Fluid/dynamic process – no “right” answer

• Differences: Simulation/Health care scenarios
  – A method of teaching for unpredictable future events
  – Variety of confounding variables & quick timeframe
  – More individually focused vs. system/organization
  – Prioritization of actions – misstep = adverse event
Flexible Learning Opportunities

• Web-based instruction enhanced - modules with interactive learning and testing options
• Hybrid Simulation
• Outside preparation that augments class
• Classroom – small and large groups, individual response systems for interactive learning (clickers, PollEverywhere, Zoom)
• Clinical/lab = High-stakes testing/Capstones
• Virtual reality – HMD, examine patient, clinic, etc
Identifying Curricular Fit

• Curriculum – concept-based, specialty-specific

• Key experiences –
  – Technical skills: asthma, hemorrhage, CPR, hypoglycemia, deteriorating patient
  – Non-technical skills: communication, team-work, therapeutic relationship – power-sharing, empathy, and trust/rapport building

• Reality-based: faculty expertise, lab resources, time management, substitution for clinical hours
Assessing Organizational Readiness

• SCORS – Simulation Cultural Organizational Readiness Survey (Foisy-Doll & Leighton, 2017)
  https://sites.google.com/site/site/scorsfile/home

• Faculty buy-in and professional development – identification of champions

• Student request - expectations
Assessing Program Objectives

• Mission & Vision of your school, fit with university and community
• Describe what your graduate will look like
• Identify theoretical frameworks underlining your approach to teaching and clinical practice
• Outline professional development
• List outcome competencies for program – match with country Registered Nurse licensing
Theories Guiding Simulation Case Development

- Blooms Taxonomy – to guide objective development (transition over time)
- Bandura’s Theory of Self-efficacy – to increase confidence for skill development
- Benner’s (1984) – Novice to Expert (here)
- NLN/Jeffries Simulation Framework
- Daley & Campbell’s Framework for Simulation Learning in Nursing Education © - to provide knowledge translation & mobilization for theory into practice
- (17 years, average time for best practices to translate into hospital practice)
Evolution: Comparison of Bloom’s Original (1956) and Bloom’s Revised (2001) Taxonomies with QSEN KSAs

Domains of Learning
- Original Bloom’s Taxonomy (1956)
- Cognitive
- Psychomotor
- Affective

Knowledge Dimension
- Revised Bloom’s Taxonomy (2001)
  - Factual knowledge
    - Conceptual Knowledge
  - Procedural knowledge
  - Metacognitive knowledge

QSEN Competencies
- The Quality and Safety Education for Nurses (QSEN) Project (2005 – 2012)
  - Knowledge
  - Skills
  - Attitudes

Anderson & Krathwohl, 2011; Bloom, 1956; Cronenwett et al., 2007

Clinical Judgment
- Critical Thinking
- Problem Solving
- Psychomotor Skills
- Clinical Reasoning

Nursing skill development and clinical judgment model (International Nursing Association for Clinical Simulation and Learning)
The Experiential Learning Cycle*

- Kolb's experiential learning style theory is typically represented by a four stage learning cycle in which the learner 'touches all the bases':

“Learning is the process whereby knowledge is created through the transformation of experience” (Kolb, 1984, p. 38).
Framework for Simulation Learning in Nursing Education

Learner brings to learning:

- Individual Experiences
- Culture

Digital culture

Learning to learn

- Think Critically
- Communicate Effectively
- Intervene Therapeutically

Foundational Knowledge

Integration

Translation to practice

Caring

Safety

Vigilance

Excellence

Improved Outcomes

Application

Failure to Rescue

Human dimension

Feedback loop

Examples of simulation pedagogy integration for IPE

- Integration throughout the curriculum
  - Multiple opportunities for IPE – passport; medication reconciliation; patient-handovers; teamwork in trauma scenarios
  - Health mentor model
- Competency-based testing at various points
  - Use to assess student competencies individually with evaluation criteria and student goals focused on IPE
- Concept-based across the curriculum
  - Develop scenarios which can be used to bring together concepts that fit many specialty areas and levels of students (e.g. medication reconciliation, ethics, informatics, communication, cultural humility)
- Scherer et al (2013) found IP simulation fostered collaboration between nursing & medical students on 3 subscales of the Readiness for Interprofessional Learning Scale: teamwork & collaboration, professional identity, & roles & responsibilities
Postpartum Hemorrhage Still Leading Cause of Maternal Death

- Leading cause of maternal mortality: **35%** of all maternal deaths
- About **14 million women** around the world suffer from PPH every year
- Maternal Mortality Ratio (MMR) has roughly **halved** between 1990 (400 per 100,000 live births) and 2010 (210 per 100,000 live births)
- However, MMR is **disproportionately high in developing countries** (240 per 100,000 live births) than developed countries (16 per live births)

Undergraduate Nursing Simulation Scenario Prep
Identifying Simulation Scenarios

4.3 kg infant of a diabetic mother is experiencing hypoglycemia and respiratory distress, potentially life-threatening. (photo)

Post-partum hemorrhage – high maternal mortality rates. (photo)

Adolescent that was admitted with the diagnosis of recurrent leukemia, for which there was no curative treatment. (photo)

1st trimester bleeding – spontaneous abortion, gestational trophoblastic disease; three emergency deliveries, high risk of maternal and/or fetal mortality. (photo)
Gaps in Nursing Simulation Research

Mariani & Doolen (2016)* identified the following gaps:
(a) outcomes,
(b) simulation design/setting,
(c) participants/facilitators, and
(d) research rigor.

Greatest obstacles: Time, resources, and support

The Elephant in the Room

• Faculty Professional Development
  – Lack of time release – added on content
  – Fee structures – do not support lab resources and IT, lab staff support
  – How are we working with faculty to prepare them?
    • Continuing Education
    • Competency requirements
    • Evaluation
Models for Integrating Simulation in the curriculum

• Map out curriculum identifying key competencies

• Create climate for faculty professional development – identify “Champions”

• Develop scenarios according to INACSL Best Practice Standards℠

• Identify combination of teaching strategies use according to programs context
Standard IX: Simulation Design

To achieve optimal outcomes, simulation design should consider the following elements:
1. Needs assessment
2. Measurable objectives
3. Format of simulation
4. Clinical scenario or case
5. Fidelity
6. Facilitator/Facilitative approach
7. Briefing
8. Debriefing and/or feedback
9. Evaluation
10. Participant preparation
11. Test of the design (Lioce et al., 2015, p. 310).
Scenario Development

• Working in teams
• Focusing outcomes – clinical, team, leadership
• Coordinating the event – date, time, place, participants
• Small scale: *in situ* – e.g. Code in ER, PPH code in OB
• Large scale: disaster planning – include first responders, government, health care practitioners, and students
Evidence-based practice (EBP) baseline for simulation scenario development

During simulation – Use current Evidence-Based Practice (EBP) guidelines

• Introduce EBP guidelines (or evidence-informed guidelines)
• Implement EBP guidelines throughout the scenario (incorporate as part of assessment check-list)
• Reinforce EBP guidelines during de-briefing or second-run of the scenario
• Assess for transfer to clinical skills by assessing on clinical evaluation tools
• Enhance synergy between classroom & clinical practice

HiOA Norway Faculty Workshop 05
March 2018 SHCampbell
Future of Health Care Professional Education

- Simulation
- Web Based Learning - Virtual Simulation
  - Virtual Clinical Excursions™ (VCE) Elsevier
  - Serious Gaming – e-Baby™ Serious Game
  - Multiplayer Virtual Worlds
  - Single User Products: CliniSpace™ (here); TINA™; Second Life™; ArchieMD™

- Virtual Reality
Virtual Simulation – Future?

• Photo of virtual reality glasses
Digital technology: VR, AR, Green-screen

- Green-screen technology: static photo or dynamic video as backdrop for illusion (e.g. car accident scene, University of Johannesburg)

Photos: SHCampbell, University of Johannesburg, South Africa 9/20/2017
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Standardization Process

Contributing factors:

• **INACSL** Best Practice Standards: Simulation SM (2016)
  – Increased confidence in reliability of scenarios, facilitation, teaching, and evaluation methods
  – NLN-INACSL Debriefing Across the Curriculum

• Society for Simulation in Healthcare (**SSIH**) Dictionary
  – Importance of speaking the same language

• Repository of Instruments Used in Simulation Research **INACSL**
Next steps

I. Many opportunities to bridge the education-practice gap and create innovative learning: need standardization, assessment, evaluation

II. Critical Reflection of Learning – Debriefing depends on initial objectives

III. Proceed with caution and use of theory in the development of policies around clinical hours/ substitution – focus on competencies and measurable learning outcomes

IV. Integrate incrementally – combine methodologies for best return on investment
Tell me more about your toolkit!
Thank you!

Contact Information:
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References - IPE

Interprofessional Education - Key papers:


References—IPE


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