The Art and Science of Simulation in Nursing Education Past, Present, Future......

Kerry Kosmoski-Goepfert PhD, RN
Mary Paquette MSN, RN

Objectives

• Summarize the development of simulation learning in nursing education
• Discuss the importance of simulation learning to nursing education & practice
• Identify key characteristics of simulation
• Illustrate the development of research in nursing simulation
• Describe future research directions for nursing simulation

ART? SCIENCE?
• How many of you currently use simulation learning?

• What is the definition of simulation?

  “to look or act like.”
  [Webster, 2003]

SIMULATION OR NOT?
Another definition of Healthcare Simulation:

Simulation is defined as “a technique, not a technology, to replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion.” (Gaba, 2004).
Why has Simulation become part of nursing education?

Complexity
Technology
New knowledge
To err is human
Accreditation
Employer demands
Medico-legal
Ethics
Faculty
Shortage & Competition
Clinical Site Shortage & Competition
Modern learning theory
Students

Does simulation offer solutions or assistance for these issues?

The evidence points to “Yes.”
But the evidence is not complete

Use of Simulation in Health Care Education
Historical Overview

1960s – “Resusci ® Anne”
“Harvey” (cardiac assessment)

1980s – Anesthesia Education
(simulated training environment)

late 1990s – Portable Human Patient Simulators introduced
(transformational – ushered in competency testing and CE)
Present Day

• The current focus in simulation includes
  • Skill development ("skill" broadly defined)
  • in a context of patient care
  • that requires the use of clinical reasoning

Simulations can be:

• Manikin based
• Actor based
• Hybrid
• Laboratory
• Health Care facility
• In situ

Simulations need to be Strategic

• Think “Patient Safety”
• Think “Clinical reasoning”
• Think “Reflective Practitioner”

• Helps guide every aspect of a simulation and simulation program
Clinical Reasoning

Critical Thinking + Decision Making + Reflection (metacognitive elements)

Simulation Pedagogy: Theoretical and Conceptual Issues in Simulation Design

- Simulation = learning tool
- Grounded in theories that focus on:
  - Learner-centered practices
  - Constructivism
  - Collaboration between individuals with different sociocultural backgrounds (Social Ecological Theory, Stokols, 1996)

Pedagogy: Simulation Design Frameworks & Models

A. Framework
   1. University of Maryland Baltimore School of Nursing Simulation Framework (Larew, Lessans, Spunt, Foster, & Covington, 2006)
      - based on Benner (1984)
      - cue based system with escalating prompts
      - recognition assessment interventions problem resolution
Pedagogy: Simulation Design
Frameworks & Models

2. Nursing Education Simulation Framework
(Jeffries & Rodgers, 2007)

- 3 key interrelated components:
  - Teacher characteristics, student characteristics, and educational practices
  - Outcomes: knowledge, skill performance, learner satisfaction, critical thinking, self-confidence
  - Design characteristics: objectives, fidelity, problem solving, student support, debriefing

The Nursing Education Simulation Framework
(Jeffries, 2007)

Pedagogy: Simulation Design
Models & Frameworks

B. Models
  1. Clinical Judgment Model (Tanner, 2006)
     - 4 components: noticing, interpreting, responding, and reflecting
     - emphasizes *Implicit and Explicit Expectations* of the situation
     - reflection = debriefing = reflection on action
     - re-do of simulation and improved outcomes
Using Simulation

Premise: A simulation must be realistic, relevant, and complex

- Replicate an episode of patient care
- Repeated practice on an essential component of care
- Developing teamwork and communication within an episode of patient care
- Illustrate & practice QSEN competencies
Simulation Design Characteristics
(Jeffries & Rodgers, 2007)

- Objectives (Learning goals)
- Fidelity***
- Problem Solving
- Student Support
  - Pre-work
  - Cues***
- Debriefing***
Fidelity

- Realism
  - Environmental Fidelity
  - Equipment Fidelity
  - Psychological Fidelity
    - Degree to which students/trainees perceive the scenario to be believable

Goals for “Reality Based” Scenarios

- For Students
  - They are the nurse
    - Actions or inactions positive &/or poor patient outcomes

- For Faculty
  - Simulations lead to MET educational goals

- Translation into Practice
  - Tap into Emotions Better retention

Student Support -- CUES

- A piece of Information that aids the memory in retrieving details not obtained spontaneously

- A hint or prompt

- May also be required to move scenario forward
Kinds of Cues

• Physiological
• Verbal
• Planned

Physiological

• Programmed for the simulator
  – Set vital signs to alarm
  – Flushing, diaphoresis, weakness

  – Placed during scenario Development
  – On-the-Fly

Verbal Cues

• Programmed
  – To be said by mannequin

• Microphone
  – Spoken by controller-scripted
  – Spoken by controller – on the fly

• Scripted or Improvisational Actors
  » TIP: Real People add Realism
Planning for Cues

• Run scenario before placing students in the learning situation
  – Allows for recognition of where cues are needed
  – Prevents students from being placed in a “blind alley”

Importance of Cueing

• Limitations of human simulators
  -- Limited Movement
    – Difficult patient - provider communication

• Keeps scenario moving forward
  – Travel down path not prepared for
    – Facilitates ability to meet multiple objectives

• Challenges some students

Overview of Cueing

• Use combination of all cues
  – Scripted, controller, on the fly
  – Rehearse, Rehearse, Rehearse
  – Add cue wherever students may go down the wrong path or need more information
  – Don’t stress, the students never know that the simulation didn’t go as planned
  – Write Down during scenario where “on the fly” cues were given then add in script for next evolution
Debriefing/Guided Reflection

• What is Debriefing?
  An essential tool to be used in simulation
  DEBRIEFING
  - sometimes overlooked
  - activity that reinforces positive aspects of the experience
  - encourages reflective learning
  - allows participant to link theory to practice and research, think critically, and discuss how to intervene professionally in very complex situations”

Why have debriefing?

• Discovery of knowledge
• Analysis and synthesis
• Clarify misperceptions/incorrect information
• Reframes the experience
• Stimulates the cognitive thinking process

Attributes of debriefing

• Reflection
• Emotion/Emotional Release
• Reception (openness to feedback)
• Integration (into a conceptual framework)
• Assimilation & Accommodation
  Transference of Learning…..
(Warrick et al. 1970)
Antecedents of debriefing

- The story
- Physiologic processes and mechanisms
- Defined learning objectives

(Dreifuerst, 2009)

Setting-up the Debriefing Environment

- Create a welcoming space
- Quiet, confidential environment
- Supportive communication
- Teacher serves as a facilitator (critical)

Challenges of Debriefing

- Lack of Faculty expertise
- New pedagogy
- Time
- Fear (consequences, self-esteem, anxiety)
- External pressures
- Environment
- Knowledge base
Exemplars of Debriefing Questions?
• Did you accomplish what you wanted to do?
• Help me understand why you performed the intervention when you did?
• Were your interactions/interventions all appropriate?
• How did you feel about the experience?

Questions continued
• What would you do next time? Anything different?
• Obstacles encountered?
• Encounter met expectations?
• Learnings that you will carry into practice?

Techniques for debriefing
• Facilitator initiates, students are primary communicators
• If an event has not occurred in the encounter, but a critical behavior or response was about to happen or could happen, take your students there...what ifs? Help them to anticipate what could have occurred
Techniques continued

• Avoid “why” questions to the student, but use the phrases “how, what, could...” “Help me to understand...”

• End on a positive statement

Summary of Debriefing: Emphasize the following:

• Focus on possibilities
• Emphasize lessons learned
• Let the participants lead the discussion and communicate
• Provide summary points at the end
• Keep the debriefing positive and safe

How Simulations can be used...

• Areas of practice across life span and continuum of care
  – Med-surg, mental health, OB, peds, home, community, geriatrics ...
• Specific skill development: communication, delegation, assessment, etc.
• Team based development: codes
• Incorporate issues: cultural, ethics, legal
• Scope of practice
Thinking creatively (“The Art”)

- Resource constraints
- Moulage
- Simulation for pre-clinical students
- Manikin versus actor
- Did the student learn? How do we know?

Group Exercise (10 minutes)

- Basic Scenario: 45 year old Mrs. K is day one post-op abdominal surgery. Her recovery has been uneventful so far. She has dressings, IVs, medications, an NG tube and foley catheter, and has begun assisted ambulation. It is expected that later today the foley and the NG could be removed.
- Your mission: To add an additional element to the above scenario to enrich the simulated learning experience. Choose one of the following categories to integrate into the story
  Categories: cultural, ethical, legal, quality, safety, confidentiality, delegation, communication

State of the Research:

Does Simulation “work?”
Early research

- Most simulation literature was descriptive and often anecdotal

- Majority of simulation research was learner self-perception of:
  - Growth of knowledge
  - Increase in self-confidence
  - Increase in competence

Early Research

- Minimal research on:
  - Outcomes
  - Transfer of Learning
  - Cognitive development

Examples of recent writings and research

- An abundance of descriptive articles:
  - Team training ("Fire in Labor & Delivery")
  - Program development ("Enhancing Pediatric Clinical Competency with HPS")
  - How schools have incorporated and use simulation
  - Articles to guide educators ("Development of evidence-based clinical simulation scenarios...")
  - For new nurses ("Enhancing leadership orientation through simulation") ("Sim techniques to bridge the gap between novice and competent healthcare professionals")
Research cont’d

• ROL:
  – Kaakinen and Arwood (2009): 120 articles
    • 94 had teacher focus (versus learner centered)
    • 16 mentioned a learning theory
    • little on cognitive development from simulation
  – Roarke, Schmidt and Garga (2010) showed lack of unifying theoretical basis.
    • 45% no use of theory
    • 45% minimal use
    • 10% adequate use of theory

Research cont’d

• Managing multiple patients
• Patient safety competency
• Cognition and clinical performance
• Impact on academic metrics
• Language revealing Learning (Arwood and Kaakinen 2009)

Tools and Evaluative Instruments

• Examples:
  – Lasater Clinical Judgment Rubric (Tanner model)
  – Clark Clinical Simulation Grading Rubric
  – Kuiper et al Outcome Present State Test Model Debriefing Tool
  – NLN tools
Issues

• Over-emphasis on simulation as technology

• “Simulation-based education?”

• Simulations as ends, rather than means

• “Outcomes-based education!”

Current Priorities for Research

• Apply fundamental educational principles and theory to simulation

• Curricular alignment – simulation as a tool to help meet program objectives

• Measure learning outcomes

• Does simulation learning transfer to workplace?

Future Research Directions in Simulation

• NLN Research Priorities
  – New pedagogies
  – Use of instructional technologies

• Learner performance outcomes

• Patient outcomes (did learning transfer and impact care delivery and outcomes?)

• Virtual Reality Simulation Centers
Group Exercise

• What is one problem, unmet need, or opportunity in your own work environment that you think could possibly be addressed through “simulation?”

Trends in Nursing Simulation

• Certification of simulation faculty and technicians
• Accreditation of simulation centers
• Collaborations and regional centers
• Standards of Practice (INACSL)
• Curriculum changes that embed simulation
• Increasing interprofessional simulations
• Educational opportunities to learn more about the “Art and Science” of Simulation