

# Focusing on Clinical Reasoning with Simulation Technology

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Changing the  
Culture of Clinical  
Education to  
Advance Learning  
and Critical Thinking

# Knowledge Acquisition in the 21<sup>st</sup> Century

- Shared
- Ever changing
- Evidence-based
- Accessible (WWW)
- Experiential / service

# New Paradigms in Education:

- a. Active Engagement
- b. Immediate Feedback
- c. Evaluation Ongoing
- d. Reflection/Critical Thinking

# Theorists:

Boyer – Experiential / professional programs

Dewey – Learning is “in the doing”

Benner – Novice to expert

# Clinical Education Today

## Affected by:

- Acuity of patients
- Technology advances
- Cost Containment / Managed Care
- Limited Instructors available
- Mandated ratios of faculty to students by accreditors
- Increased home care

# How Critical is Critical Thinking ?

(Danielsen, 2008)  
“Clinician Reviews”

Dorothy Del Bueno Quote from  
“A Crisis in Critical Thinking”, 2005

“Only 35% of new RN grads meet entry level expectations for clinical judgment .... the majority are unable to translate knowledge into practice.”

# 1999 – Institute of Medicine Report

“To Err is Human”

State Regulatory Boards  
Accreditors  
Competency Statements

# PEW Health Commission Competencies

- Provide evidenced based, clinically competent care
- Demonstrate critical thinking, reflection and problem solving skills

# NLNAC Criterion #13A (Critical Thinking)

Identified as Essential skill for  
Nursing Curricula

# C. T.:

- “a tool of inquiry”
- “purposeful, self-regulatory judgment”
- “not rote or mechanical or non-reflective”

(Facione, 1990, p3)

# Definitions of Critical Thinking

a. Clinical behaviors or judgments widely accepted as safe and beneficial

(Tropello, 2005)

b. Purposeful, self regulatory judgments associated with clinical decision making, diagnostic reasoning & problem solving and acquiring knowledge of practice area

(Delphi Study)

C. T.:

A broad set of cognitive skills and habits of mind.

(Clinical decision-making and reasoning applies these skills)

(Jansen, 2006)

# C. T. Skills:

1. Analyzing
2. Applying Standards
3. Discriminating
4. Information Seeking
5. Logical Reasoning
6. Predicting
7. Transforming Knowledge

(Rubenfeld & Scheffer, 2000)

# Habits of Mind of Critical Thinkers (Synergistic)

1. Confidence
2. Perspective (contextual)
3. Creativity
4. Flexibility
5. Inquisitiveness
6. Intellectual integrity
7. Open-mindedness
8. Perseverance
9. Reflection

# Assessment Tools / Tests for Critical Thinking:

1. CCTST
2. Watson-Glaser Critical Thinking Appraisal
3. Del Bueno's content driven exams
4. Self assessment of learning outcomes (McCroskey, 2000)

# Thinking Clinically

“intentional process of problem solving and reflection in action with content expertise”

(Benner, Stannard and Hooper, 1996)

- Key word in Facione's definition of critical thinking is "interactive".
- Students must interact over time in an environment in which they are expected to function for confidence and expertise.

# Cultivating CC Skills

1. Clinical Exams or Practical Labs
2. Reflective Papers and Diaries (write down one's considered judgments after debriefing and reflection)
3. Journal Clubs (critical appraisal of studies and cases)
4. Clinical Case Studies (small group presentations)
5. \*Simulation\* (planned deliberate feedback – repetition/mastery)

How can we ensure  
that Critical Thinking  
will be enhanced while  
engaging Simulation  
Technology in clinical  
education?

# Relevant Intellectual Skills Need to be Woven into Theory and

## Practice:

1. Analysis (of each situation presented in relation to planned objectives)
2. Synthesis (information from many sources relating to scenario)
3. Reflection (evaluations relating new knowledge to prior understanding of case)

# Schon (1991) – Connecting Action to Higher Order Thinking Skills Through:

- Reflection-in-action
- Reflection-on-action

(Simulations, debriefing and reflection)

# What is a Reflective Practitioner?

Mesirow (1981) states nursing education highlights the importance of reflecting in and on daily situations so they understand and adapt to new demands.

# To Become a Good Clinical Thinker:

1. Raise relevant questions
2. Analyze and interpret from relevant assessment
3. Provide reasoned interventions – conclusions based on standards
4. Modify thinking based on practical implications (self correct when atypical)
5. Communicate effectively with others to negotiate complex problems

(Weber, JAANP, “Promoting Critical Thinking in Students”)

# Predictive Validity

“The best predictor of future performance is practicing in a simulated situation”

(Weber, 2008)

# Definition of Simulation (SSH)

“A Technique,  
Not a Technology”

# Types of Simulations:

- Role Play
- Case Studies
- Standardized Patients
- Partial Task Trainers
- Mannequins
- Low Fidelity Simulators
- High Fidelity Simulators

# WHY NOW ?

- ✓ IOM / Safety
- ✓ ↓ Real World Options
- ✓ ↑ Acuity, ↓ Access
- ✓ Cost
- ✓ Effectiveness
- ✓ Readiness in Technology
- ✓ Crisis in Critical Thinking

# Simulation Technology Advantages (Fletcher, 1995)

1. The clinical setting can be realistically simulated
2. There is no patient safety threat
3. Active/experiential learning can occur
4. Specific and unique patient situations can be simulated
5. Errors/actions discussed and corrected immediately
6. Consistent and comparable experiences can occur for all students

# Can Cover All Domains of Learning

- 1) Cognitive
- 2) Affective
- 3) Psychomotor

(Benjamin Bloom, 1956)

Patient Safety is Primary Advantage to Simulation over Learning in real clinical scenarios.



Other Advantages:

- ✓ Peer communication with fellow learners
- ✓ Pausing, reflection
- ✓ Repetition for safety + accuracy
- ✓ Taping/Viewing/Trouble Shooting
- ✓ Confidence building
- ✓ Clinical interaction
- ✓ Skill building → Expertise

# What Holds Us Back?

(Tropello, 2009)

1. Technology for technology sake
2. No uniform standards in industry
3. State Boards reluctant to substitute simulation for clinicals
4. Location and resources
5. Training for facilitators
6. Rewards for same
7. Reluctance of healthcare disciplines to work together

 Critical Thinking =  Outcomes

- a) From Skills to Linkages
- b) From Silos to Teamwork
- c) From Practice Alone to  
Communication
- d) From Simple to Complex

# Hypotheses Often Seen

- If critical thinking equals good choices in clinical judgment, these translate from lab-simulated to real practice settings once student achieves competencies with simulated patient scenarios
- Use of technology to simulate skills ↓ fear in real life settings and ↑ adaptation safety.
- Achieving competencies on simulators ↓ orientation requirements on entry into practice since students have managed patient cases in a controlled environment and perfected skills.

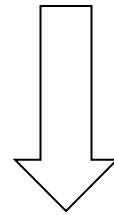
# Critical Thinking in Practice Algorithm

Clinical Problem → Nurse interprets relevant data → Does reasoning based on previous knowledge → Decision formulated and enacted based on analysis (Turner, 2005)

Anecdotal Evidence in  
Nursing of Simulators  
↑ Outcomes

+

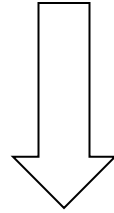
Long term Evidence  
↑ Outcomes in Airline  
Industry/Anesthesia/Military



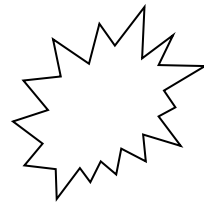
## Predictive Validity

(Successful problem solving ability with  
simulation so that skills + judgment transfer  
when need arises)

# Non-Active Pedagogy



## Active Learning Simulation Inclusion and Integration



### Paradigm Shift in Clinical Education Programs

The student who achieves Critical Thinking becomes one who rescues and is a safe and competent practitioner. This is accompanied with organizational and management abilities that increase with more knowledge and practice, along with the ability to implement change that benefits healthcare status.