Use of Theory in Simulation

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Objectives

1. Identify two theories to guide simulation work.
2. Apply a theoretical framework to simulation design and facilitation.

What is a theory?
Why is it important?

Worldview = knowledge + understanding + environment + practice

Who uses theory?

AS A FRAMEWORK FOR YOUR SIMULATION PROGRAM?

FOR SPECIFIC SIMULATION ACTIVITIES?

Why use a theoretical framework in simulation?

Why is this an important conversation?

Lack of evidence that theoretical framework is used in simulation, research, education, etc.

Variety of theories from several disciplines

Challenges abound when considering theory
◦ Program
◦ Activity
◦ Personal preference
◦ Limited knowledge
◦ Popularity
◦ Feasibility

What theories are you using?

Select Learning Theories for Simulation

Behaviorism	Cognitive	Constructivist	Simulation
Classical Conditioning (Skinner; Pavlov)	Conditions of Learning (Gagne)	Adult Learning Theory (Knowles)	NLN Jeffries
	Novice to Expert (Benner)	Scaffolding Theory (Vygotsky)	CPS (Khalili)
	Deliberate Practice (Ericsson)	Reflective Practice (Schön)	
	Cognitive Load (Sweller)	Clinical Judgment Model (Tanner)	
	Social Learning Theory (Bandura)	Experiential Learning (Kolb)	
	Skill Acquisition Theory (Dekeyser)	Situated Learning (Lave & Wenger)	

Behaviorism

Classical Conditioning
◦ Skinner
◦ Pavlov

Stimuli   **Outcome**
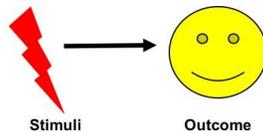
Cognitive

Learning isn't a passive activity

Learning occurs through mental processes / strategies to move information to long term memory

Deliberate Practice (Ericsson)

The development of expertise come down **primarily** to practice, practice and more practice
◦ Setting specific goals.
◦ Obtaining immediate feedback.
  Concentrating as much on technique as on outcome

Musicians, athletes

Pilots time in flight simulator

Health care professionals?

Theory in Practice: *Deliberate Practice*

Cognitive Load Theory (Sweller)

Learning and problem solving within the context of how information is processed

Addresses limitations of working memory
- Items that require a lot of mental processing may negatively impact learning (accessing memory)
- Repetition and practice leads to automation of certain tasks—freeing up memory for more complex tasks
- Tasks with high levels of interactivity can increase cognitive load

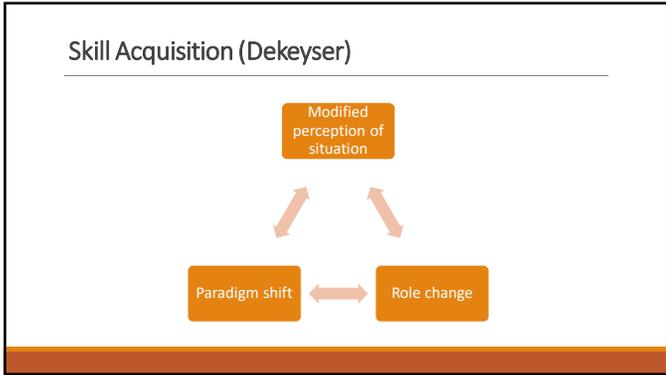## Social Learning/Social Cognition (Bandura)

Humans are capable of learning by observing other humans perform a certain action and/or exhibit a certain behavior
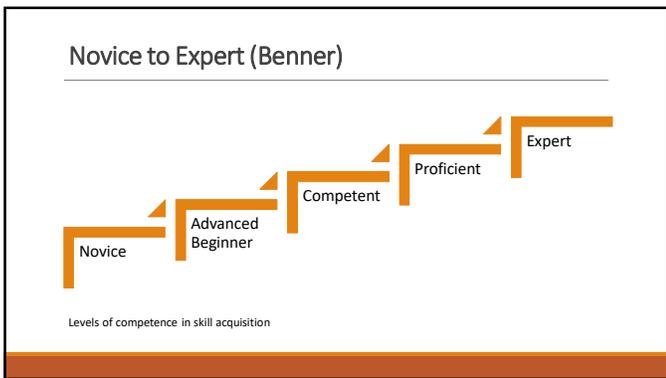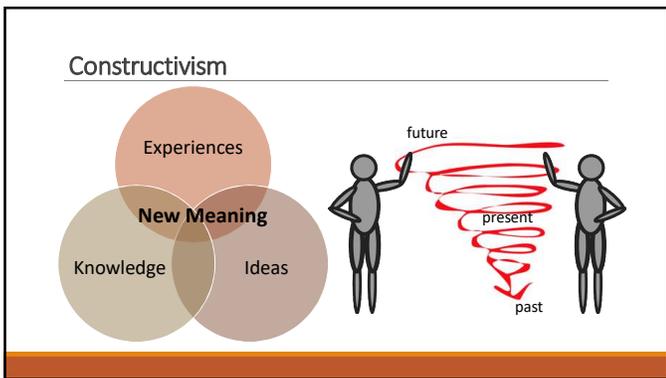
Sources of learning:
- Observation of role models
- Collaborative learning with peers
- Practice with feedback & reflection

Conditions of Learning (Gagne)

1. Gaining attention
2. Informing learners of the objective
3. Stimulating recall of prior learning
4. Presenting the stimulus
5. Providing learning guidance
6. Eliciting performance
7. Providing feedback
8. Assessing performance
9. Enhancing retention and transfer (generalization)

Skill Acquisition (Dekeyser)

Modified perception of situation

Paradigm shift ↔ Role change

Novice to Expert (Benner)

Expert

Proficient

Competent

Advanced Beginner

Novice

Levels of competence in skill acquisition

Constructivism

Experiences

New Meaning

Knowledge

Ideas

future

present

past

Adult Learning Theory (Knowles)

◦ Art & science of teaching adults
◦ Learners are autonomous & self-directed
◦ Educators are facilitators
◦ Learners have tremendous and varied life experiences to which they connect learning
◦ Learners recognize value of learning
◦ Learning is self-initiated and tends to last a lifetime
◦ Reasons to learn include change in skill, behavior, knowledge and attitude

Wittmann-Price & Price, 2015

Clinical Judgment Model (Tanner)
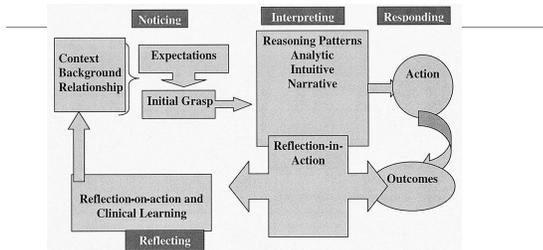
From: Tanner, C. A. (2006). Thinking like a nurse: A research-based model of clinical judgment in nursing. *Journal of Nursing Education, 45*, p. 208.

Reflective Practice (Schön)

◦ Educators are called to develop as reflective practitioners (Schön, 1983)
◦ Important human activity in which people recapture an experience, think about it, mull it over and evaluate it (Boud, Keogh, & Walker, 1985)
◦ Technique that encourages critical thought, either with self or another individual or group (Whittmann-Price, Rockstraw, & Kirk, 2015)
◦ Thoughtful and self-regulatory (Kaakinen & Arwood, 2009)
◦ Specific process (Scanlon & Chernomas, 1997; Riley-Doucet & Wilson, 1997)
  ◦ Awareness
  ◦ Critical analysis/appraisal
  ◦ Discussion
  ◦ Self-awareness

Experiential Learning (Kolb)

Knowledge is created through the transformation of experience.
◦ Concrete experience
◦ Abstract conceptualization
◦ Reflective observation
◦ Active experimentation

Experiential Learning components
◦ Providing an experience
◦ Thinking about the experience
◦ Identifying improvements
◦ Planning the learning needed
◦ Putting the learning into practice

Grant & Mardsen (1992)

Situated Learning (Lave & Wenger)

Learning is situated
◦ Embedded within activity, context & culture

Knowledge needs to be presented in authentic contexts

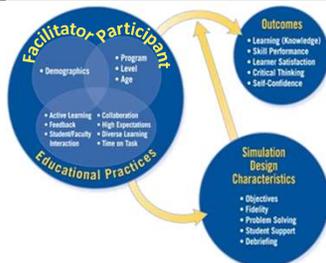Social interaction & collaboration are important
◦ Community of practice

Scaffolding Theory (Vygotsky)

Scaffolding is the support given during the learning process

o Expert assisting a novice, or an apprentice.

o Level of support changes to fit need and potential level of performance.

o More support is offered when a learner is having difficulty or first learning a new task. Supports are gradually removed as learner develops.
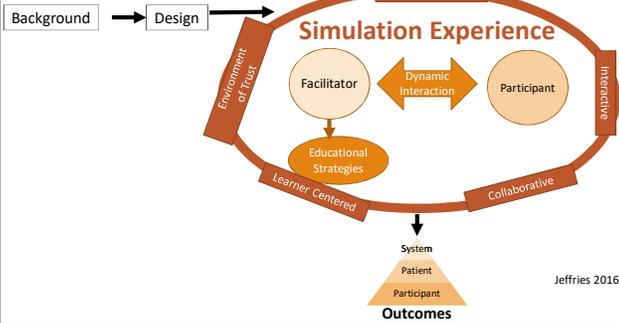
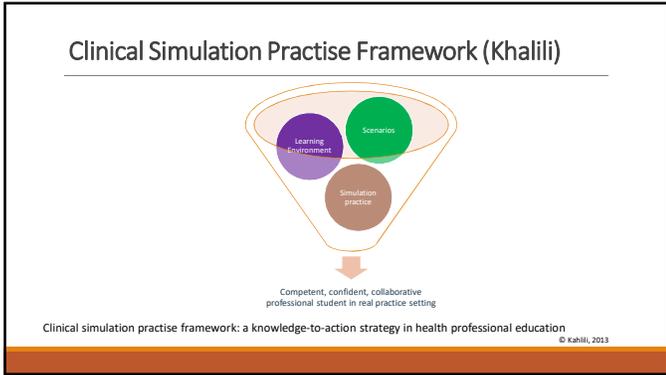# Simulation Specific

NLN/Jeffries Simulation Framework

Jeffries, 2012

NLN-Jeffries Simulation Theory

Jeffries 2016

Clinical Simulation Practise Framework (Khalili)

Competent, confident, collaborative
professional student in real practice setting

Clinical simulation practise framework: a knowledge-to-action strategy in health professional education

© Kahlili, 2013

CPS Key Strategies and Associated Impact

◦ Providing a non-judgmental and nonthreatening learning environment
  ◦ Ease students' anxieties and stress
  ◦ Encourage sharing and reflection on thought and ideas
◦ Applying experiential learning along with critical reflection
  ◦ Improve students' engagement in simulation
  ◦ Assist students in discovering strengths and weaknesses
  ◦ Assist students in gaining self-confidence

CPS Key Strategies and Associated Impact

◦ Employing scenarios with some degree of fluidity and flexibility
  ◦ Assist students to overcome the limitations of the controlled and structured simulation environment
  ◦ Add to the realism of the simulation
◦ Replicating the reality of the workplace: a true- to- life simulated clinical setting
  ◦ Foster students' professional growth and professional role learning (competence)
◦ Using interactive, inclusive, interprofessional patient- centered simulated practice
  ◦ Improve students' therapeutic communication, holistic care, collaborative practice, critical thinking and clinical judgement

Implications of Learning Theories for Simulation

Behaviorism
- Risk of negative reinforcement
- Tasks/procedures practice

Cognitive
- Cognitive load
- Developing mastery/expertise
- Observation of role models and collaboration in practice context
- Initiation into communities of practice with increasing responsibility

Constructivist
- Active learning, construction of meaning, authentic problems
- Reflection about practice
- Application of principles in new situations

Simulation Specific
- Framework encompassing several concepts, theories.
- Global—can be used beyond individual activities

Choosing the theory for your simulation program

Single theory approach

Multi-theory approach
◦ Incorporate aspects of different theories to create your own
◦ Choose different theories depending on situation (participants, type of simulation)

Advantages & Disadvantages
◦ Using one theory versus several
◦ Simulation specific theory versus education or other theories

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