Introduction to Simulation Based Education

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Objectives

• Describe fundamental concepts of simulation-based education

• Discuss briefly the relevant educational theories supporting simulation based education

• Describe elements of a well-designed simulation-based education to achieve good outcomes
Basic Assumption & Engagement

• We believe that everyone participating at this session is intelligent, capable, cares about doing their best and wants to improve

• Seeking your engagement: experiential learning during this session may need some suspension of disbelief and we understand you may act differently than in real life.

• We strongly recommend that you share ideas as an ally – during the session

• We ask that you not comment on other people’s performance outside of this session
What is Simulation?

- A “technique” NOT a “technology”
- Interactive and often “immersive” activities that recreate experiences of a real-world environment
- To amplify or replace actual experiences
Simulation in Healthcare

• Simulation: imitating an act or a system

• Major purposes:
  – Education,
  – Assessment,
  – Research, and
  – Health system integration

• To improve the safety, effectiveness and efficiency of health care delivery and individual, team & system performance
Learning Theories & SBE

- Andragogy (Knowles)
- Cognitive Load Theory (Sweller)
- Kolb’s Experiential theory
- Reflective Learning (Dewey)
- Skill acquisition (Dreyfus/Benner)

Chart/figures/Illustration by Usha Asirvatham, Course Faculty
Skill acquisition Theory

• The cognitive phase

• Associative phase

• Autonomous phase
KOLB’S Experiential Theory

Concrete Experience
(Doing something)

Reflective Observation
(Reviewing/reflecting on the experience)

Abstract Conceptualization
(Concluding, learning from the experience)

Active Experimentation
(Trying out what one has learned)
Dreyfus/Benner Model of Skill Acquisition

Novice
- Tends to see actions in isolation
- Needs close supervision
- Text book knowledge

Advanced Beginner
- Sees actions as a series of steps
- Working knowledge of key aspects of practice
- Able to achieve some steps using own judgement
- Supervision needed for overall task

Competent
- Good working & background knowledge
- Able to address most tasks using own judgment
- Sees actions at least partly in terms of longer term goals

Proficient
- Deep understanding of discipline and area of practice
- Able to take full responsibility of own work
- Routinely achieves acceptable standards
- Sees the full picture

Expert
- Excellence achieved with relative ease
- Sees overall picture and alternate approaches
- Authoritative knowledge of discipline
- Recognizes patterns
- Able to responsibility for going beyond existing standards and creating own interpretations

Chart/figures/Illustration by Usha Asirvatham, Course Faculty
Realism

• Helps to engage participants
• Influences both the initial learning and later the transfer of learning
• It’s only a tool
• Is not unidimensional (High or Low Fidelity), but multi-dimensional
• Can we match the level of fidelity to the learners – Novice Vs. Experienced?
# Realism – Fidelity – Multi dimensional

<table>
<thead>
<tr>
<th>Physical (environmental)</th>
<th>Conceptual</th>
<th>Emotional/Experiential (Psychological/Sociological)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics, chemistry, anatomy, biology, etc.</td>
<td>Theory, meanings, concepts &amp; relationships</td>
<td>Holistic experience of the situation</td>
</tr>
<tr>
<td>The sensory information from the surrounding environment - Visual, auditory, tactile realism</td>
<td>Scenario’s integrity and flow Pt’s physiological, Pharmacological &amp; emotional responses – should make sense</td>
<td><strong>Psychological</strong> Degree to which a learner perceives or accepts the situation as real Dress and act real Treat mannequins as real Real, proper names to actors involved in scenarios <strong>Sociological</strong> Hierarchies in a care team, power relations &amp; professional identity</td>
</tr>
<tr>
<td>Important for developing kinesthetic skills – to improve muscle memory</td>
<td>Important for developing clinical reasoning and problem solving skills</td>
<td>Important to manage complex processes</td>
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<td></td>
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<td>Anxiety - fine balance – “desirable difficulties”</td>
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</tbody>
</table>
Types of Simulators

- Task Trainers
- Hybrid Simulations
- Standardized patients
- Virtual reality and Games
- High Fidelity mannequins
QUESTIONS?