Simulation – Learning – Realism
Elements of simulation-based learning environments

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*Co-operation with Laerdal and SimuLearn – No royalties

Overview

• Reality vs. Realism
• Learning with simulation
• Simulator Setting
• Three forms of thinking about realism
• Summary
Concepts on the use of simulators and simulations

Reality vs. Realism

- Reality
  - Does something exist? (Ontology)
    - Yes, simulators and scenarios do exist.
    - Real people are using them.
    - Simulation has its own reality.

- Realism
  - Is something (a copy, a replication) similar to another thing (the original)?
    - Simulators
    - Simulations
    - are in some, but not all aspects realistic
**Simulator vs. Simulation**

- **Simulation**
  - Mechanism
  - Model
  - Program
  - Verbal Simulation

- **Simulation Scenario**
  - Story
  - Role Players

**Patient simulator**

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**Verification vs. Validation**

- **Validation**: Does the simulation work for its purpose?

- **Verification**: Was the simulation performed as planned?

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Dieckmann & Rall (2007)
Learning with Simulation

Concrete Experience

Participant Instructor

Feedback

Active Experimentation

Revision/Practice

Abstract Conceptualisation

Live & Video

Reflective Observation

Scenarios & Debriefing

Theory Input

Reflection Session

Kolb’s Learning Cycle

Educational Use of Simulation

Goals

Fidelity

Simulation

Work System Analysis

Training Requirements

Required System Changes

Other Moderating Factors

Contents

Target Group/Individual

Methods

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Simulatortraining

“It is not how much you have, but how you use it”
(Salas, Bowers & Rhodenizer, 1998)

“The key is the program, not the hardware”
(Caro, 1973)
Simulation Applications in Medicine (modified from Gaba, 2004)

Simulator setting

Participant's Organisation

Pre-Briefing

Simulator Course

Knowledge
Skills
Attitudes
Anticipations

Application
Reconstruction
Transformation

Dieckmann & Wehner (2002)
Dieckmann et al. (2003)
Dieckmann (2005)
Simulator setting

Dynamic role changes: different learning needs

Two reality levels
Cookies’n X-Rays

Scenario: Acting “as-if”
The Fiction contract
(Eco, 1994)

- Ambiguous Information
- Roles
- Competencies
- Borders of scenario

Difference to the willing suspense of disbelief

A broken fiction contract

Watterson (2002)
A Complex Social Endeavour

Co-operation

Trainer

Trainee(s)

Relevance?

Clinical Setting

Dieckmann, Gaba & Rall (2007); Scerbo (2007), Rudolph et al. (2007)

Interview Study

(Dieckmann, Manser, Wehner & Rall, 2007)

Anticipation

External influences on the experience of the scenario from outside the scenarios

Experienced simulator competence

Scenario

Overall impression

Medical plausibility

Own actions of participants

Technical aspects

Role play of simulator team

Workload

Training course

Research setting

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Three modes of thinking
(Laucken 2003; Dieckmann, 2005; Dieckmann, Gaba & Rall, 2007)

• Physical mode
  – Centimeter, gram, seconds

• Semantical mode
  – Information, relationships, concepts

• Phenomenal mode
  – Direct experience of a situation

Prior Experience
Instructor vs. Participant
(e.g. Verification)
Match between forms of realism and learning goals

- Physical
- Semantical
- Phenomenal

- Declarative Knowledge
  - Facts, Relationships
- Procedural Knowledge
  - Putting knowledge into practice, decision making
- Dexterity – Psychomotor
  - Hand-eye co-ordination
- Attitudes
  - Priorities of safety, norms & values
Simulation = (Reality – X) + Y

Clinical Setting

Simulator Setting

Guernica - Pablo Picasso, 1937
### Advantages | Disadvantages
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realism | Easy to understand | Learning potentials not used
un-realism | Questioning habits | Possible misunderstandings

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**Implications**

- Different framing of simulation for us and for participants
  - Not despite…but because of
  - Discussing (dis-)advantages of X and Y
  - Simulation has it’s own reality (real simulator, real people, real actions …)
- Closer analysis and better communication of different modes of simulator reality
Contact

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