
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

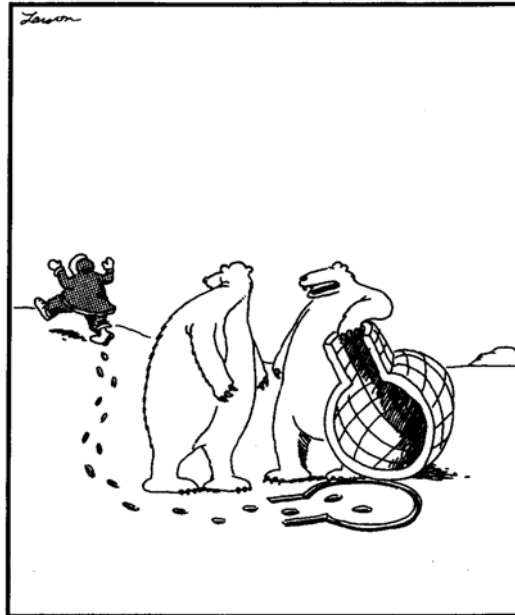
This is fiction



This is for real



Concepts on the use of simulators and simulations



"I lift, you grab. ... Was that concept just a little too complex, Carl?"

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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 } are in some, but not
 - Simulations } all aspects realistic

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Simulator vs. Simulation

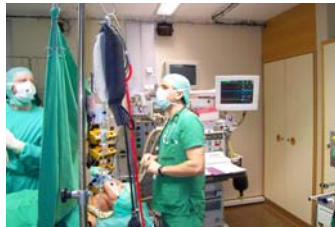


Patient
simulator



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</head>
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</body>
</html>
```

**Simulation
Mechanism**
Model
Program
Verbal Simulation



**Simulation
Scenario**
Story
Role Players

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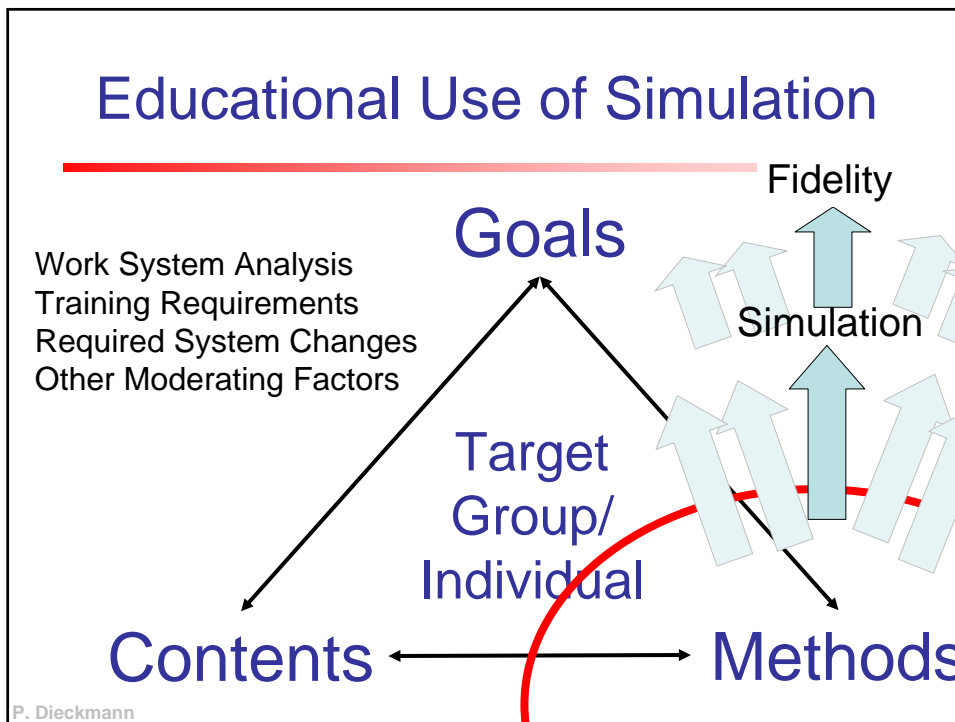
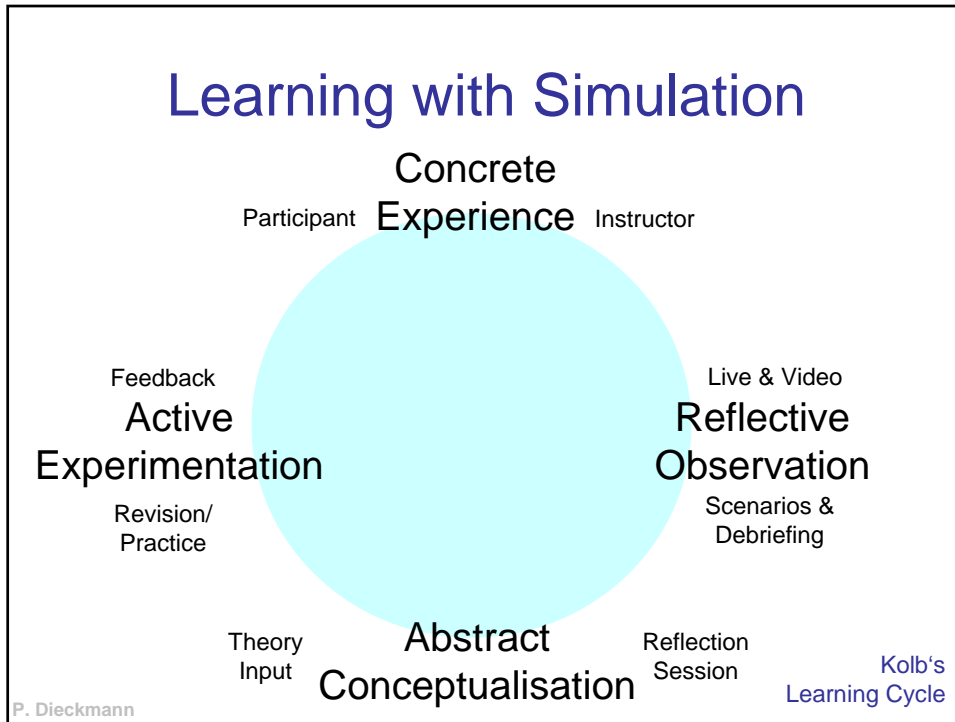
Dieckmann & Rall (2007)

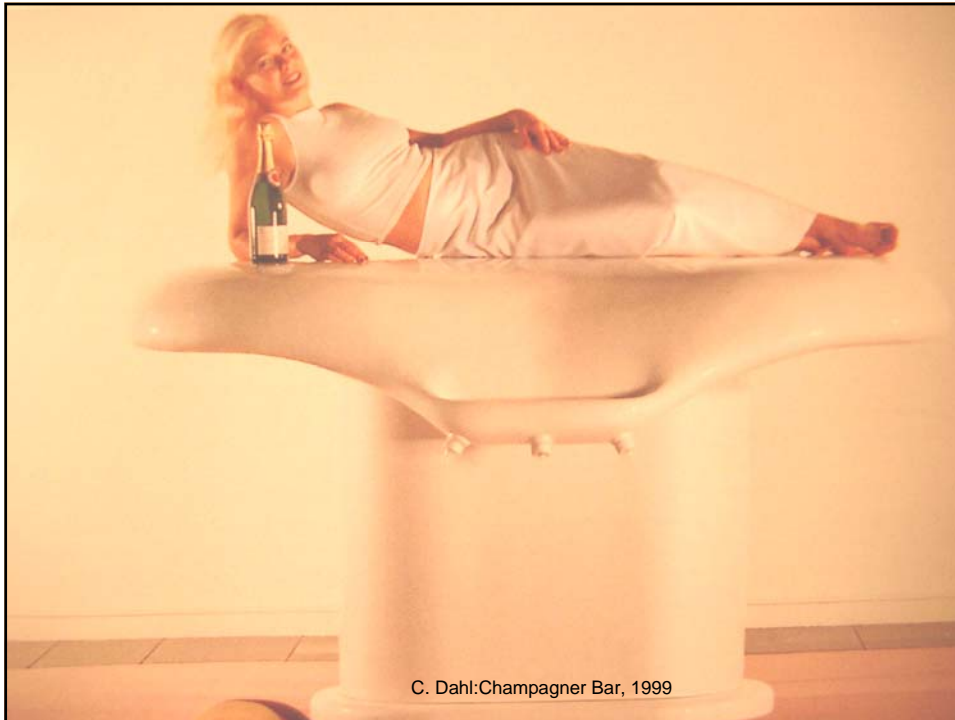
Verification vs. Validation

- Validation: Does the simulation work for its purpose?
- Verification: Was the simulation performed as planned?

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Feinstein & Cannon (2002)

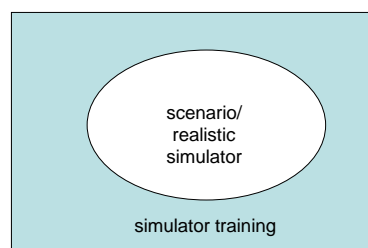


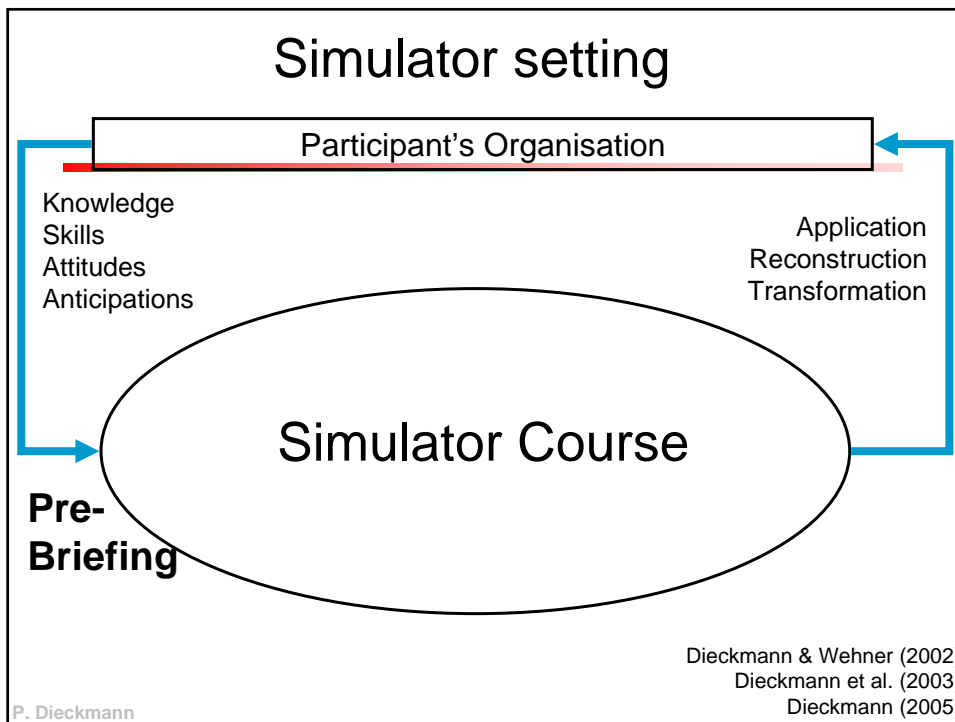
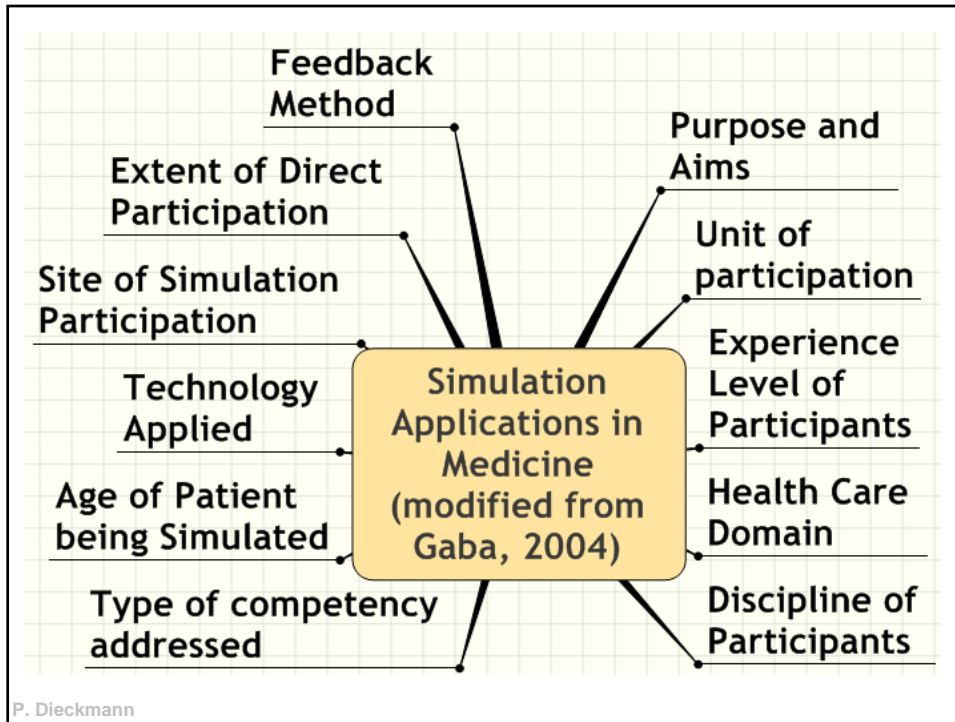


Simulatortraining

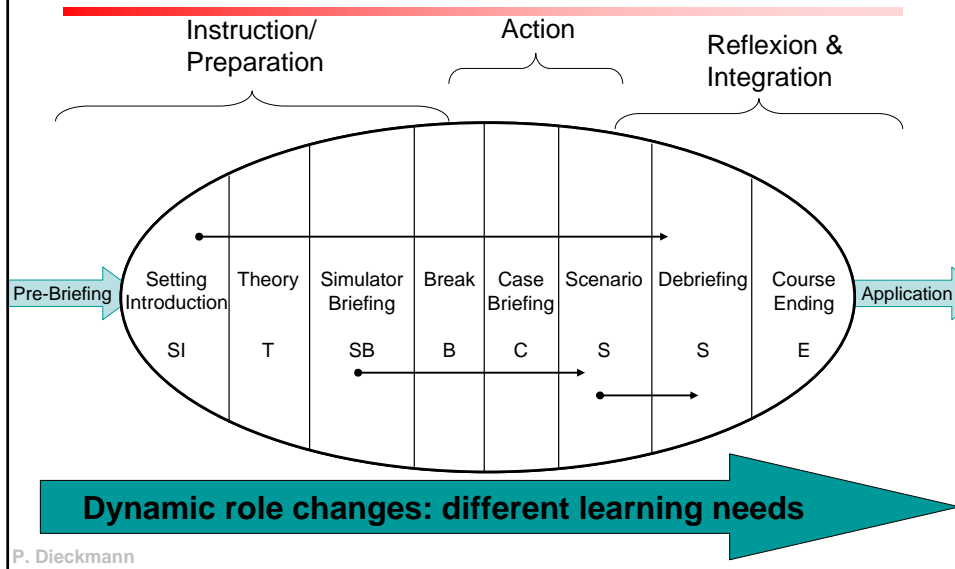
“It is not how much you have,
but how you use it”
(Salas, Bowers & Rhodenizer, 1998)

“The key is the program, not
the hardware”
(Caro, 1973)

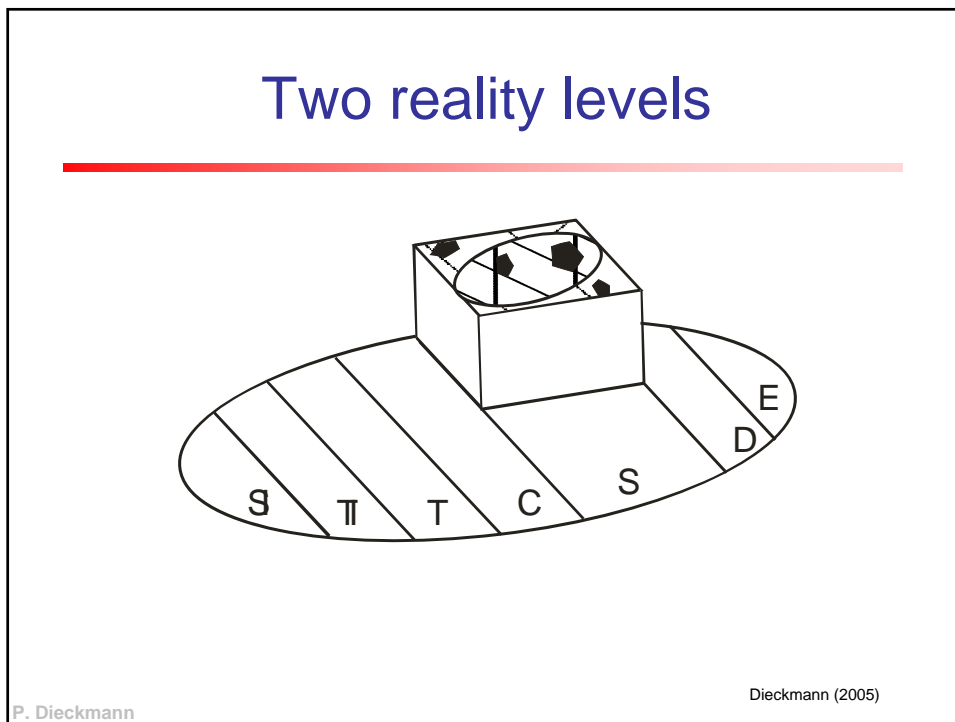




Simulator setting



Two reality levels

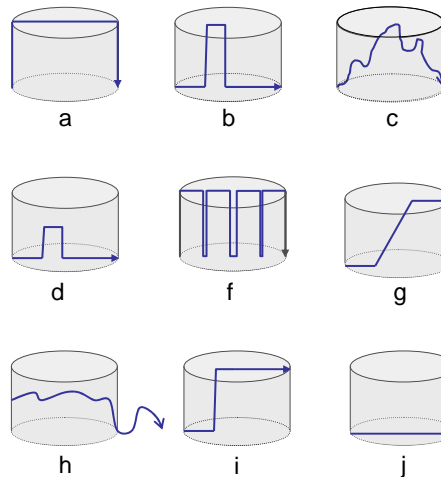
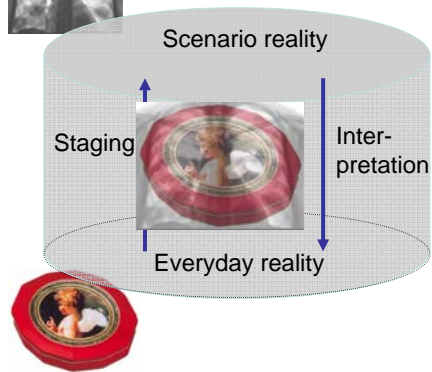


Cookies'n X-Rays



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Scenario: Acting "as-if"



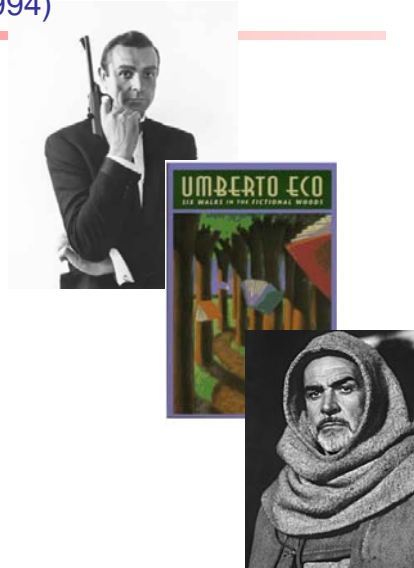
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The Fiction contract

(Eco, 1994)

- Ambiguous Information
- Roles
- Competencies
- Borders of scenario

➔ Difference to the willing suspense of disbelief



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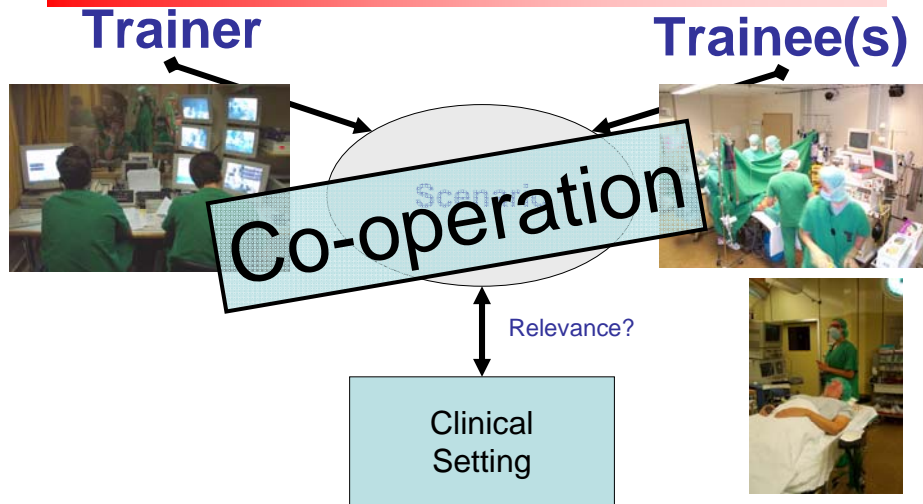
A broken fiction contract



Watterson (2002)

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A Complex Social Endeavour

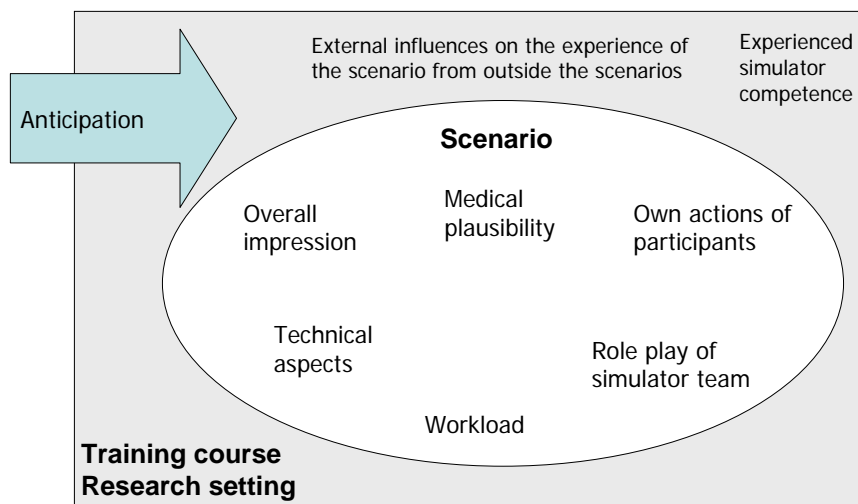


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Dieckmann, Gaba & Rall (2007); Scerbo (2007), Rudolph et al. (2007)

Interview Study

(Dieckmann, Manser, Wehner & Rall, 2007)



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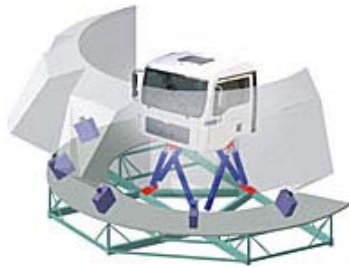
Three modes of thinking

(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)

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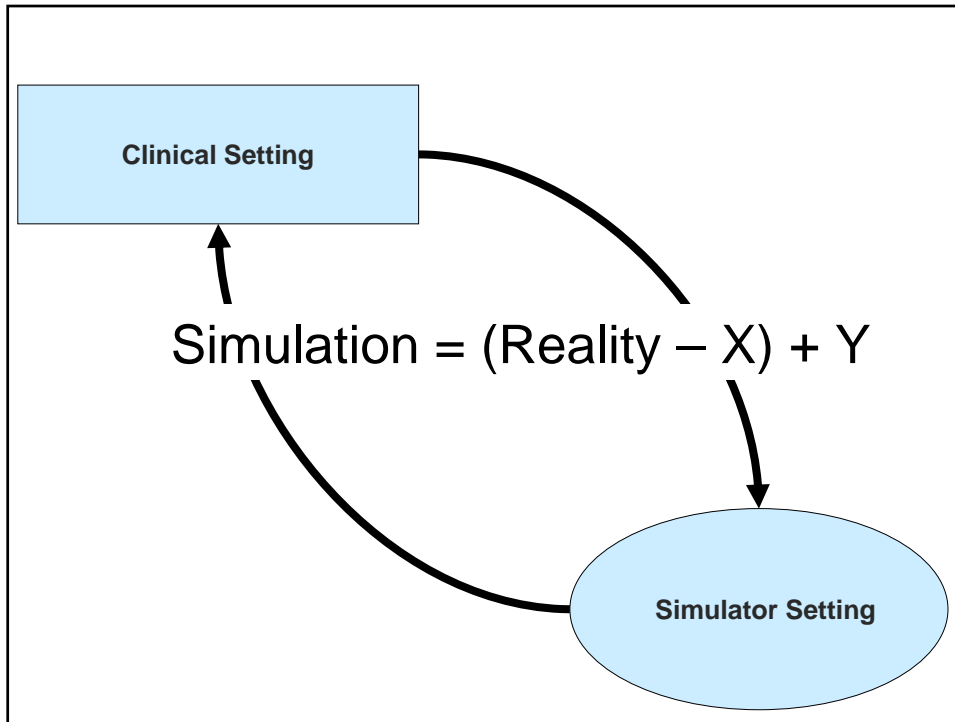


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Match between forms of realism and learning goals

- 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

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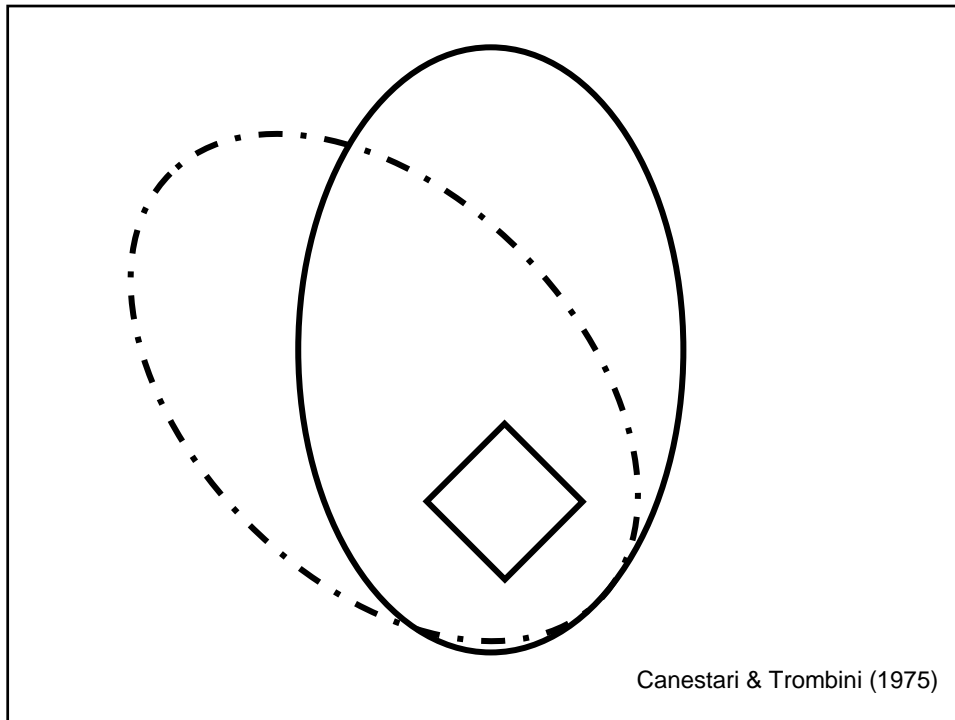
	Advantages	Disadvantages
realism	Easy to understand	Learning potentials not used
un-realism	Questioning habits	Possible mis-understandings

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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

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