Theme 4:

Learning with simulated worlds

State of the art

What makes a well designed serious game, from the angle of cognitive psychology?

- **Goal is achieving deep understanding of the situation and being able to apply knowledge.**
- **That demands the construction of an elaborated mental model**
- **Problems: Cognitive load imposed on players, information presentation rate, and extent of processing**

We identified three design guidelines:

1. Guiding attention,

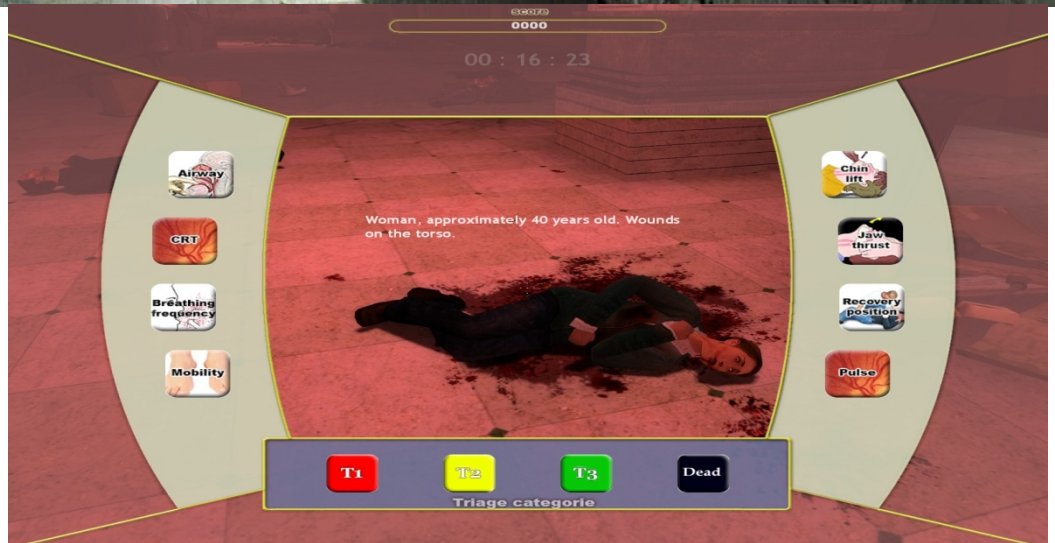
2. Information regulation, and

3. Extending the depth of processing

Game research for training and entertainment

Game Code Red Triage

Game Code Red Triage was created, which trains medical first responders in a crisis situation.



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Impact of results so far (1)

- **Guiding attention:** cueing
  - Auditory cues — no positive effects on learning (only for experienced players useful);
  - Visual cues — visual better than auditory mode
- **Information regulation:** Gradual presentation of
  - More complex interface: (slight) positive learning effect
  - More difficult cases: no learning effect
- **Extending depth of processing by variation in narrative structure:**
  - Introduction of surprising events: deeper comprehension
  - Introduction of foreshadowing and backstory: more curiosity , but no significant learning effect (but positive tendens)

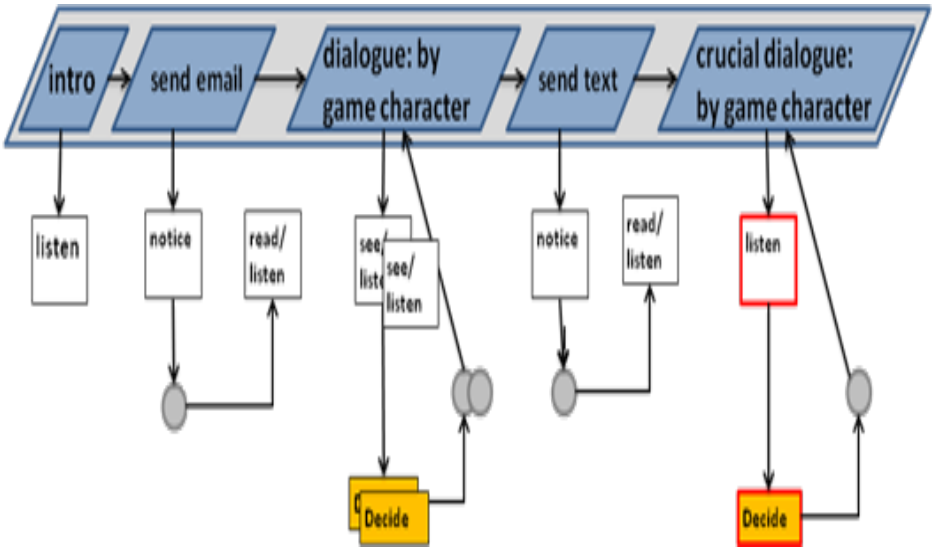
Impact of results sofar (2)

GameDNA (*Game D*iscourse *N*otation and *A*nalysis):

Development of a method and graphical way of describing the information flow, actions of the player and the system and their interaction.

(in cooperation with Ranj and GITP)

Example of one scene:



Challenges from now on (1)

Methodological

- Involving eye-registration research: it is very important to know whether players pay attention to certain areas, e.g. where the cues were manipulated.

- Assessment of deeper levels of knowledge (mental model assessment by determining knowledge representations in terms of semantic networks)

- Assessment of transfer effects (see WP4.4 Transfer of gaming)

- Framework to align game genre (e.g., action, puzzle), type of design (e.g., schematic, photorealistic) and circumstances (e.g., domain, type of knowledge)

Challenge from now on (2)

Optimalization of outcomes

- Role of adaptivity (fitting level of difficulty to ability level, in order to optimize motivation) (see WP 4.1 Adapting the game to the world)

- Design of support mechanisms while playing a game
  - E.g. by simplifying the game presented, schematizing the simulated world, or providing dynamic support

Enhancement of intrinsic motivation

- By strengthening narrativity in games and manipulating components (see also WP 4.2 Design rules for learning through simulated worlds)
- By implementing curiosity, challenge, and surprise

Challenge (3) and Impact

GameDNA

- Validation of GameDNA in other situations (and usefulness for different stakeholders)
- Development of GameDNA as a software package, a tool that incorporates notation, layering, adjustable views and features

Impact

- Better design tools
- Evidence based guidelines

enable creation of more effective and engaging serious games

Game research for training and entertainment

Invitation to meeting

Special Meeting for

Companies who are interested in Theme *Learning with Simulated Worlds*

Aim: to examine ways to cooperate with us

Tuesday, 21 June 15-17

BuysBallot Lab, Institute of Information and Computing Sciences, UU,

Room 445, Princetonplein 5, Utrecht

Information: Herre@cs.uu.nl

Theme 4:
Learning with simulated worlds
Transfer of Gaming

Definition

Transfer of Gaming

To what extent skills, learned by playing a game, can be effectively used in the real world.

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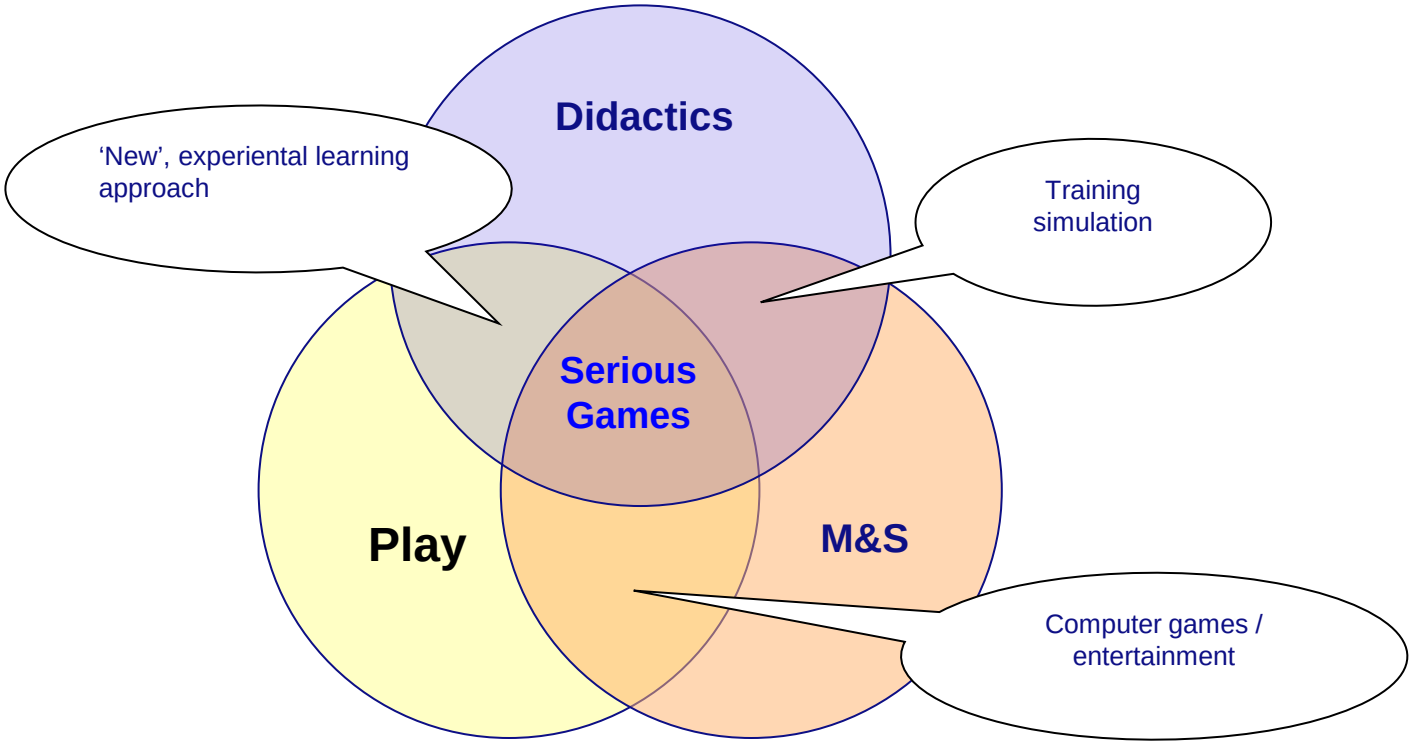
So far…

- Methods and measures for determination of Transfer of Gaming (ToG)
- Transfer studies comparing ToG in games (Falcon 4, MS Flight)
- Development and validation of the JOT method (VBS2)
- Stepwise method for the development of cost-effective games with optimal transfer of training
- Taxonomy
- Overview with best practices focussing at SG at the workplace


Three knowledge area's / perspectives



Impact so far

Impact so far:

- higher awareness of didactical aspects
- validation is high on the agenda

Validation is still an issue

Experimental research:

Comparing a game groep with a control group

- Pre-/Posting control transfer
- Uncontrolled transfer method
- Quasi-transfer method
- Backward transfer method
- Simulator performance method

•Expensive
•Time-consuming
•Complex

Challenge

Challenge:

- comprehensive framework

- generic tool (type, applications, target groups, educational context)

Impact

Impact:

- better games with higher training value
- more trust/acceptance in the educational world

Relevant factors

- market failure
- government failure
- system failure

Game research for training and entertainment

PC gaming transfer taxonomy **(outline)**

Attitudes		
Motivation		**++**
• **Initiative**		**+++**
• **Integrity**		**+**
Social skills		
Communication		**+++**
• **Cooperation**		**+++**
• **Leadership**		**+++**
Cognitive skills		
• **Interpretation**	**+**	
• **Problem solving, decision making**		**+++**
• **Planning**		**+++**
Knowledge		
• **Background, context, boundary conditions, specific facts**	**++**	
• **Workig with rules and procedures (if…, then…)**	**+++**	
• **Functionality (how it works, controls, interfaces)**	**++**	
Perceptual-motor skills		
• **Searching, detection, perception (different modalities)**		**-**
• **Operation (controls, instruments, displays)**		**+/ -**
• **Motor performance**		**- - -**