

# Serious Games

Hauptseminar "E-Learning – Sommersemester 2008

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# Outline

1. Definition
2. Games in Society
3. Types of Serious Games
  - 3.1 Learning Games
  - 3.2 Military Games
  - 3.3 Games in Health Care
  - 3.4 Persuasive Games

# 1. Definition

## 2. Games in Society

## 3. Types of Serious Games

### 3.1 Learning Games

### 3.2 Military Games

### 3.3 Games in Health Care

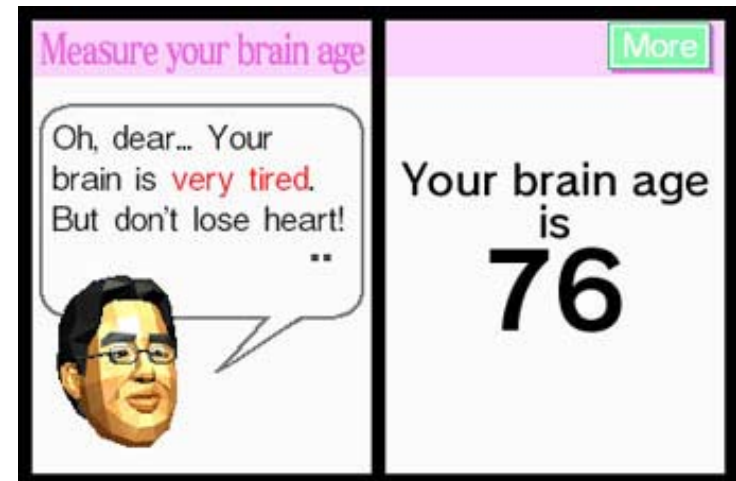
### 3.4 Persuasive Games

# Definition

- Term „Serious Game“ is not easy to define
- Simple Definition:  
*„Serious games are games that use the artistic medium of games to deliver a message, teach a lesson, or provide an experience.“*  
(Michael and Chen 2006)



America's Army  
(Source: Modeling Virtual Environment and Simulation Institute)



Dr. Kawashima's Brain Training  
(Source: Nintendo)

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# Game Impact Theory

- Game industry made a turnover of over ten billion dollars in 2007
- Games will be used by more and more industries because of
- Five core forces (Roger Smith, 2007):
  - Cost advantage of hardware platforms
  - Sophistication of software applications
  - Social acceptance of game tools
  - Successes in other industries
  - Innovative experiments in the adopting industry

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# History

- 1980s: personal computers first used in schools
- 90s: multimedia aspects of PCs grew
- Educational software very successful
- Little time to use games in schools => main targets: homes, parents
- 2000: internet started to be very successful => “edutainment”
- Now game developers work together with teachers to design games which can be used in the classroom

# Learning Effect

- Schoolwork and play clearly separated
- Learning content integrated into a game => motivation increases
- Games bring together players cooperatively and competitively
- Structure of Learning in games is different:
  - Learning by Doing
  - Learning process has a high contingent of trial and error
  - Just learned knowledge can be demonstrated immediately
- Are students able to learn as much with video games as with traditional learning?

# Learning Effect (cont.)

- Study by Wee Ling Wong et al.
- “Metalloman” (learn about biological structures by navigating through the human body)
- Main Questions:
  - Can an interactive media format provide better learning experience?
  - Is an enriched multimedia format better than interactive hypertext format?
- Four Conditions:

	High Media Richness	Moderate Media Richness	Low Media Richness
Interactive	<b>Game</b>	<b>Hypertext</b>	
Non-Interactive	<b>Replay</b>		<b>Text</b>

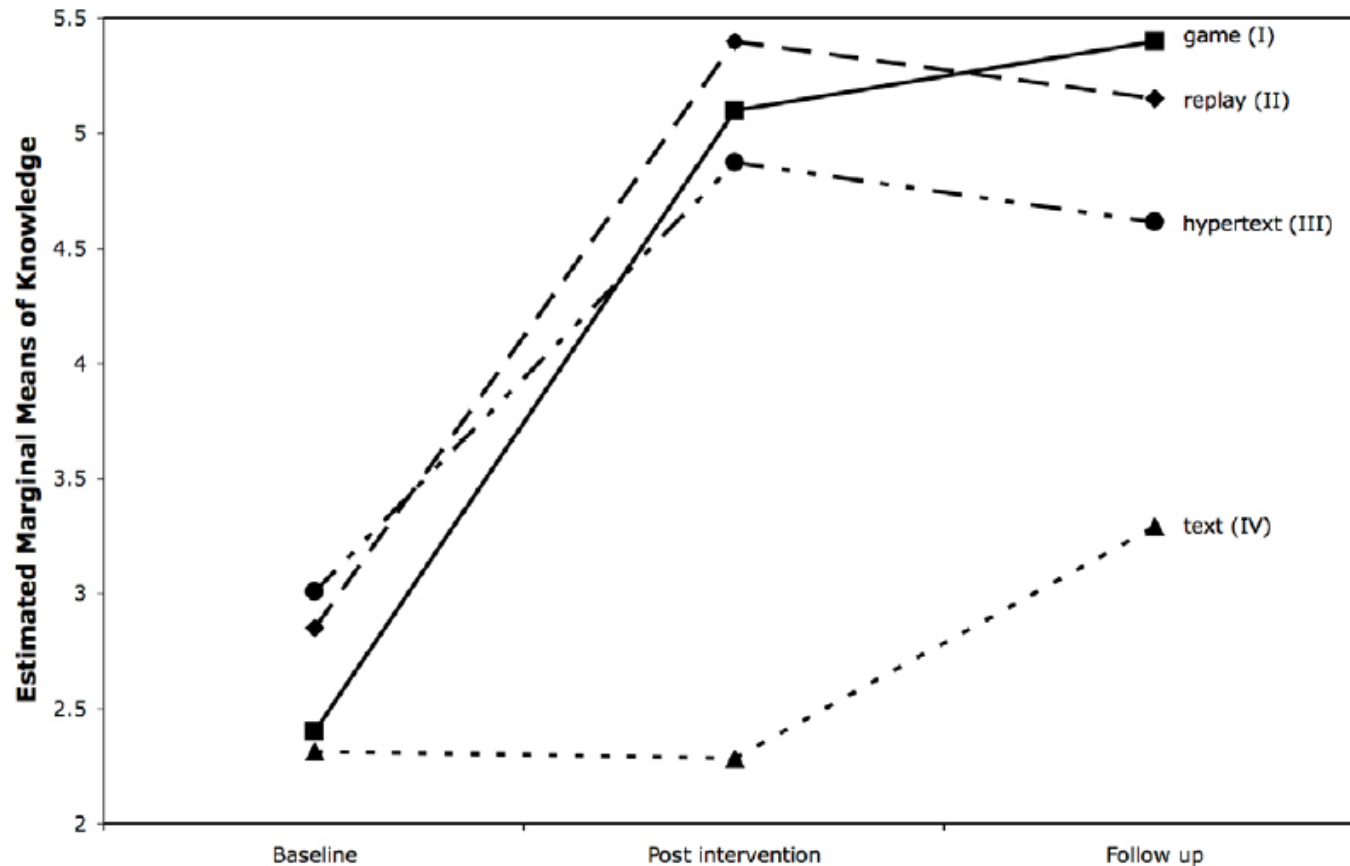


Metalloman  
(Wong et al., 2007)

# Learning Effect (cont.)

Results:

- Game highest effect on knowledge gain, text lowest
- Replay had similar learning effect as the game => interactivity important?



# Design of an Educational Game

(Michael and Chen, 2006; Stapleton, 2004)

- Game should not have video sequences/cut scenes which interrupt the gameplay
- Teacher should have the possibility to start the game at every point which is useful for the day's lesson
- Educative content should be integrated properly into the gameplay
- Usually budget is not as big as the budget for normal games
- Is a game really the best solution to support a certain field of learning?

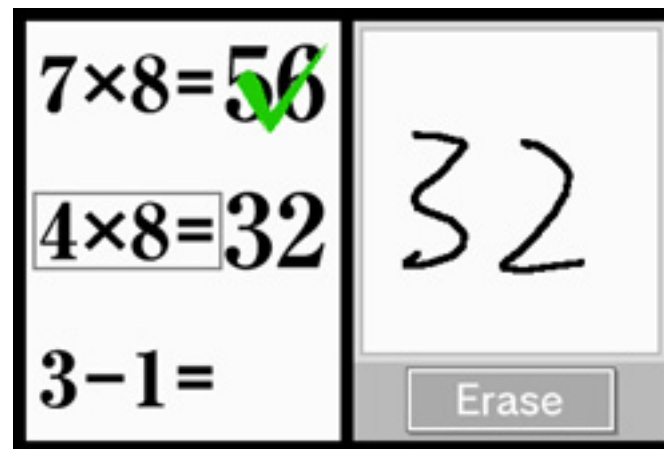
# Examples



Power Politics III (Source: Kellogg Creek Software)



Quest Atlantis (Barab et al. 2005)



Dr. Kawashima's Brain Training

(Source: Nintendo)

# Problems Caused by Insufficient Design

## Examples (Jantke, 2006):

- “Physikus”:  
learning section is clearly separated from the game
- “Brand im Hafen”:  
there is no learning section at all
- “Genius Unternehmen Physik”:  
learning part feels like a punishment
- “Genius Task Force Biologie”:  
learning part is not necessary



“Genius Unternehmen Physik” (Jantke, 2006)

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# History

- First war games: “Chaturanga”, “Wei Hei”, “Chess”
- Modern war games since the 17th century (e.g. “Kriegsspiel” 19th century)
- Computer technology allowed games to get more complex
- 1980s: SIMNET project
  - goal: develop all major simulation systems as networked devices
  - designed for specific task training
  - simulations of actual battlespaces
- 1998: “Spearhead” - first attempt to transfer the SIMNET experience onto a desktop computer
- Possibility to move simulators to a PC presents high cost savings

# Benefits for the Military

(Michael and Chen, 2006)

- Player's multi tasking ability improves
- Players learn to stay calm and controlled in chaotic circumstances
- Multiplayer games help to develop team skills
- First Person Shooters enhance ability of identifying friend from foe
- Practice of target prioritization
- Willingness to take aggressive action increases

# Examples



America's Army

(Source: Modeling Virtual Environment and Simulation Institute)



Tactical Iraqi (Source: Alelo Inc.)



Falcon 4.0 (Source: MirrorSoft)

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# Exertion Games

- “Exertainment” - combination of video games, fitness and medicine
- making physical exercise more attractive by adding elements of video games
- Examples:



Dance Dance Revolution

(Source: Health Foods Blog)



Table Tennis for Three

(Mueller and Gibbs, 2007)

# Games in Therapy

- Treatment of phobias
- Patients are confronted with models of their fears
- Controlled but realistic environment
- Virtual Reality Medical Center (VRMC):
  - 5000 Therapy sessions with computer simulations
  - success rate of over 92% (Dr. Mark Wiederhold, President of VRMC)
- Games also used to distract patients during certain procedures

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# Games as a Persuasive Technology

- goal: transport a political, religious or cultural message
- user is put right into the action
- player is not a passive observer
- => fewer distance to the message
- effectiveness?

# Examples

## “Howard Dean for Iowa” (Bogost, 2007)

- target group: Dean sympathizers
- should motivate them to engage in campaign activities
- two parts of gameplay: strategy part, three mini games



(Bogost, 2007)

- informal analysis of online responses: game was able to increase interest
- game failed to distinguish Dean from any other political candidate
- no information about Dean's goal or political program

# Examples (cont.)



September 12th

(Source: [www.newsgaming.com](http://www.newsgaming.com))



Peacemaker

(Source: ImpactGames)

# Examples (cont.)



## Velvet Strike

(Source: [www.opensorcery.net/velvet-strike/](http://www.opensorcery.net/velvet-strike/))



## dead-in-iraq

(Source: <http://www.delappe.net/>)



# Conclusion

- Use of video games in serious industries
- Learning Games:
  - Combination of education and entertainment
  - Effectiveness?
- Military Games:
  - Simulations to train soldiers
  - Motivate civilians to join the army
- Games in Health Care:
  - Exertion Games
  - Games in Therapy
- Persuasive Games
  - Deliver a message

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