

# The magic circle, or how I learned to stop worrying and love the bugs

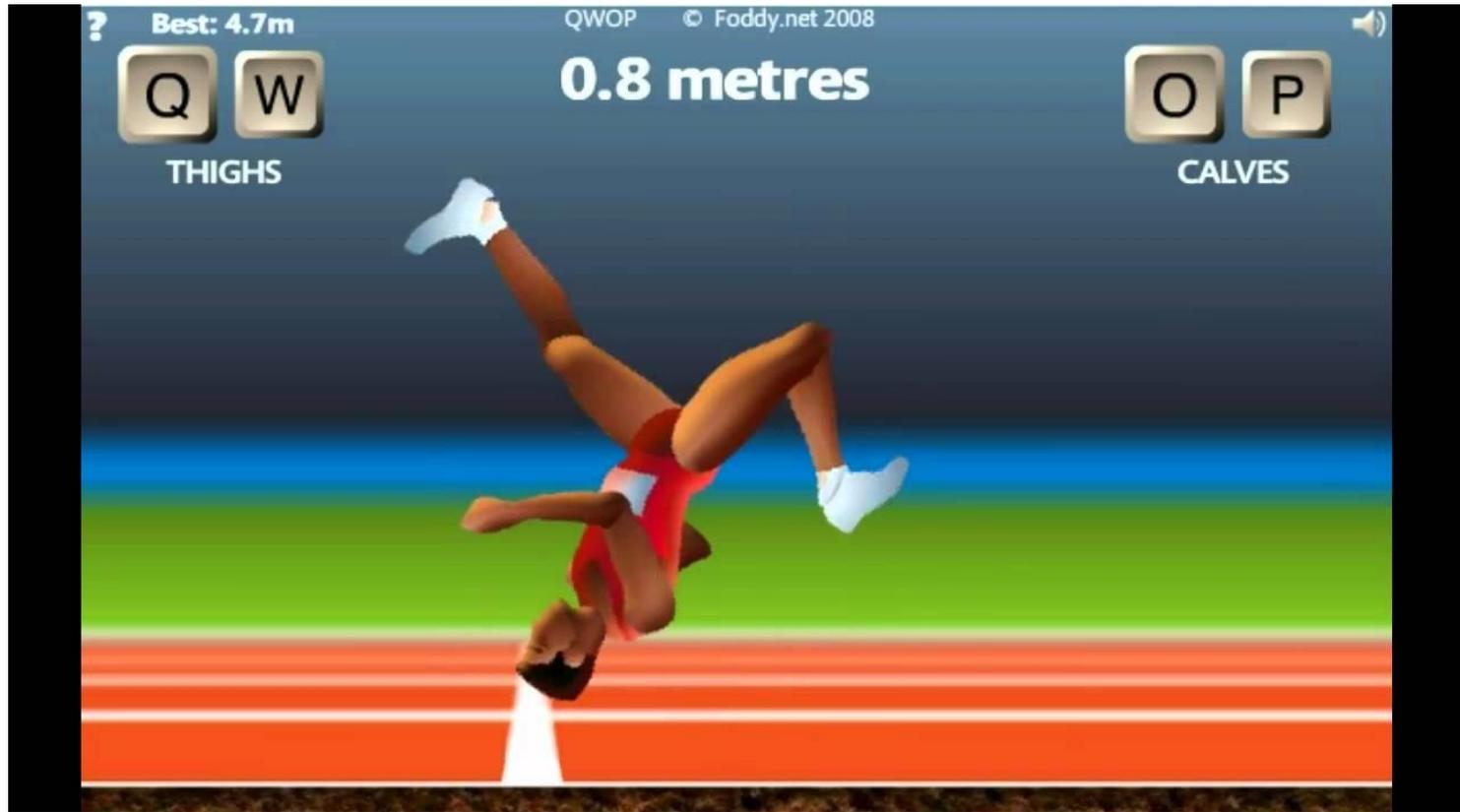
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University of Technology

Where innovation starts

# About my own PhD (and beyond)



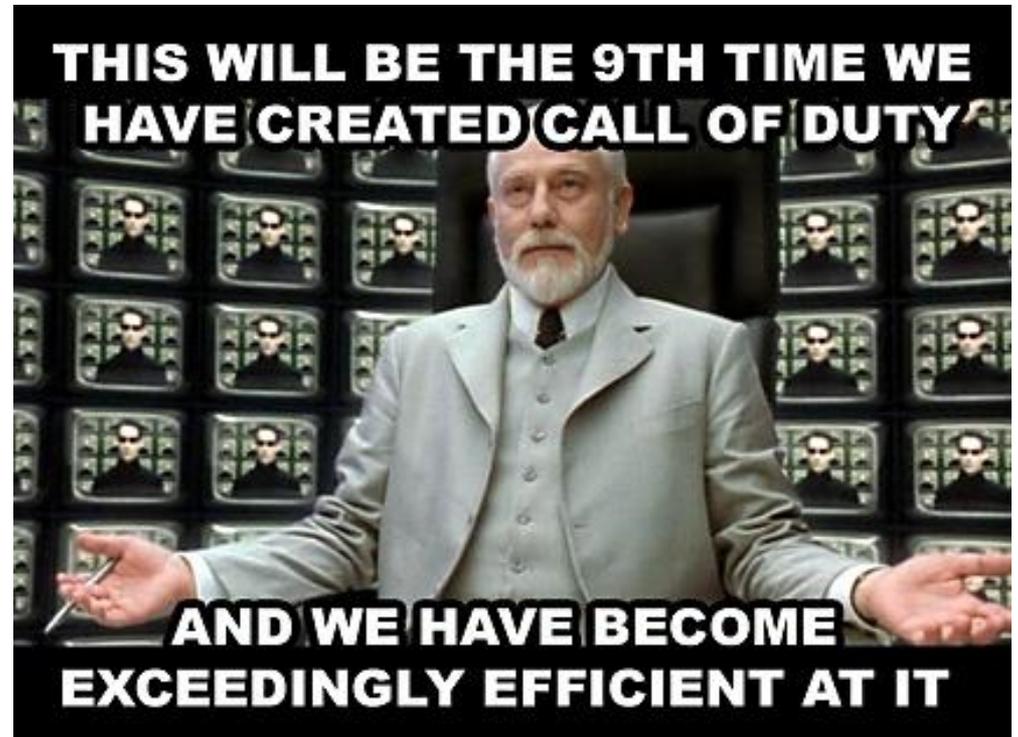
# Improve game design

- Improve find design guidelines for.. what metric exactly?



# Improve games

- Certainly games seem to be getting “better”



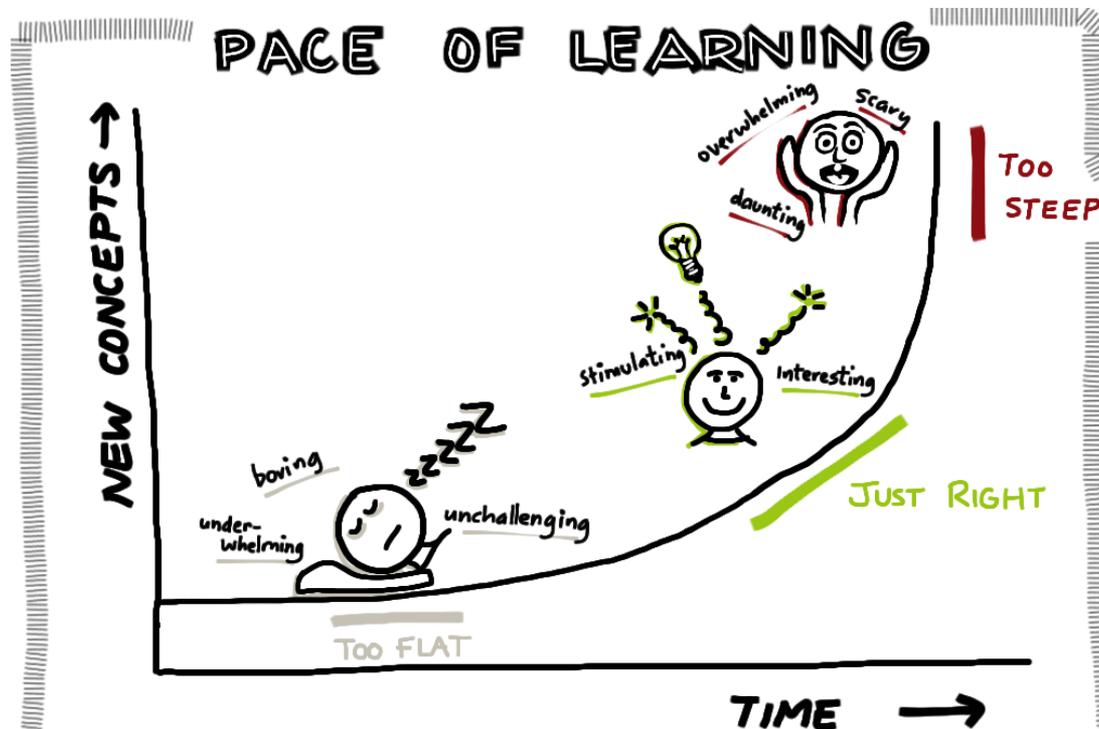
# Improve serious games

- Measurable (learning) goals



# Learning

- Learning can be made more efficient
- Learning curve is the backbone of a game



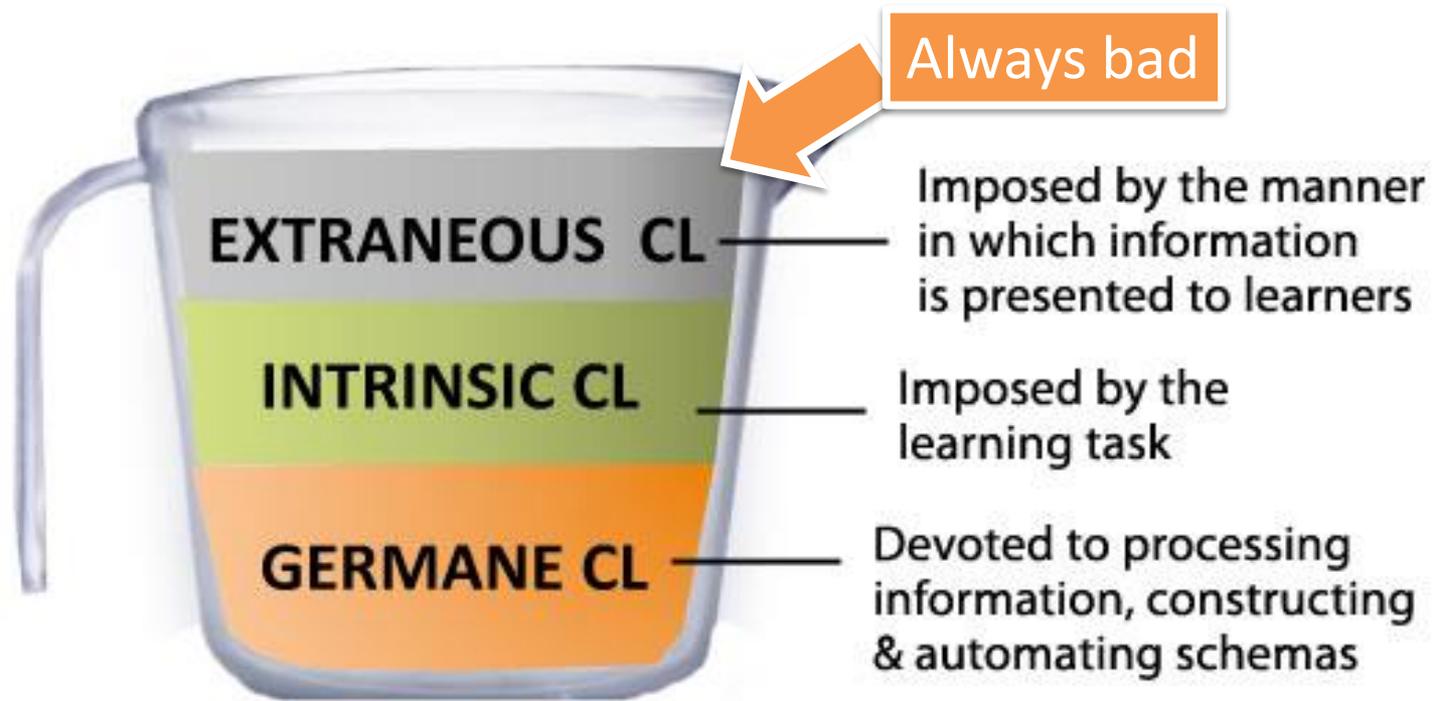
# Serious games

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- All games revolve around learning
- And are motivating!
  - More cognitive effort
  - Play at own pace
  - Engages poorer students
  - Continue learning outside of classroom
  - Attitude for lifelong learning



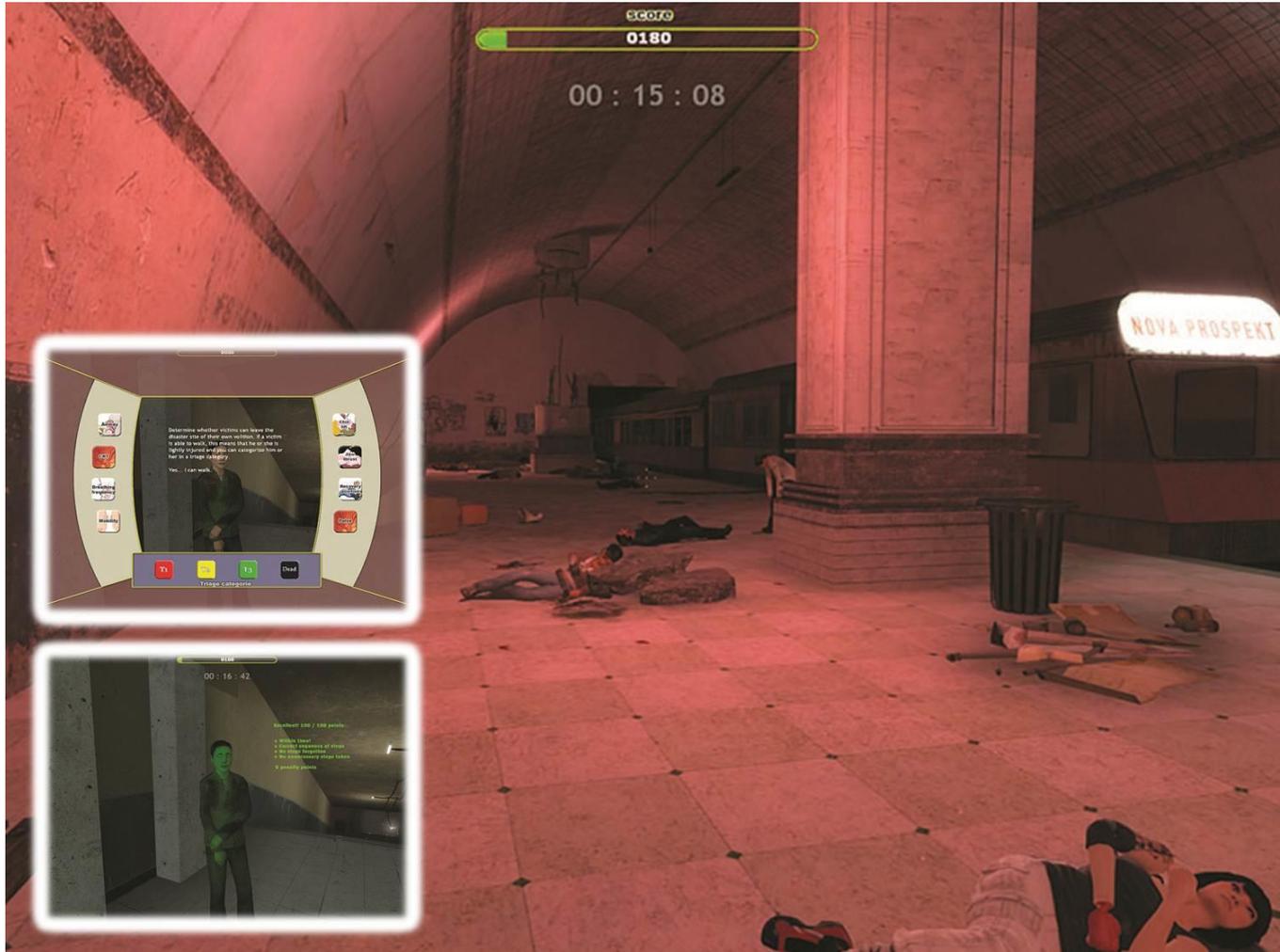
# Cognitive load theory



# Cognition in games

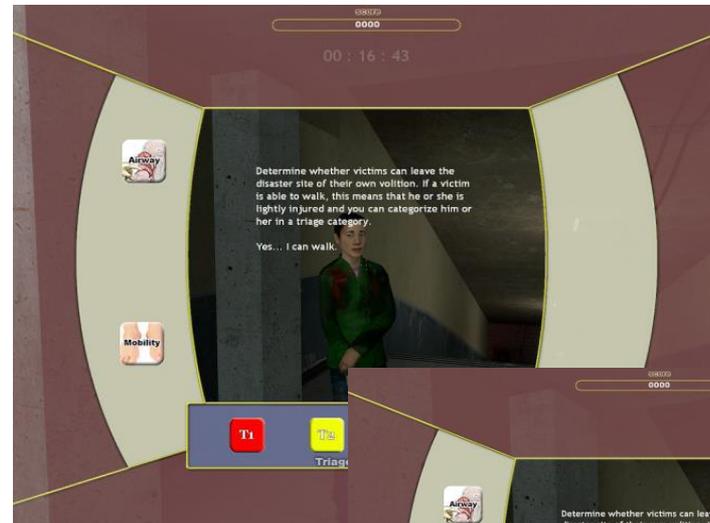


# Serious game for triage training



# Experiments

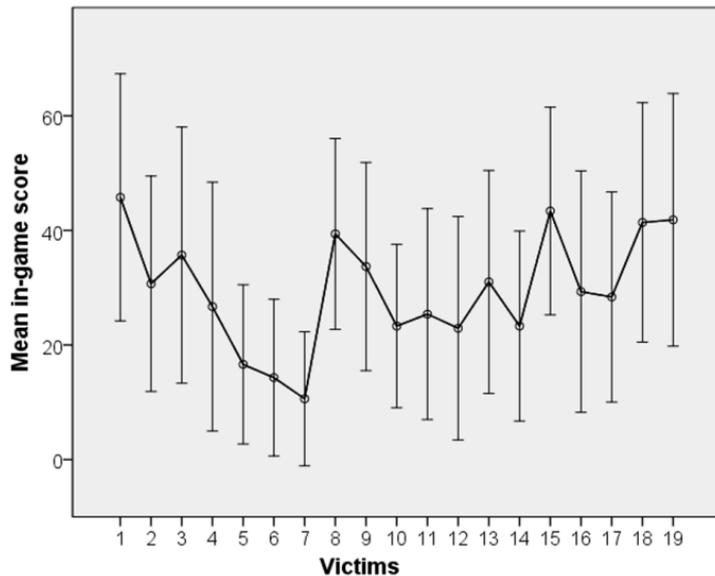
- RCTs on improving the ease of learning



score 10

# Experiments

- And to improve cognitive interest/effort (knowledge construction)



# Results

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- Lead to interesting results; some things didn't work (e.g. cueing), some things did improve learning efficacy (e.g. surprising events)
- Overall a better understanding how learning in games works and how to improve it
- But my interventions didn't make the game more fun (though not the main goal)



# Results

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1	2	3	4	5

- **But, also no difference in engagement between the game and a powerpoint**

# Meta-analysis

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- **Serious games are efficacious, often more so than traditional instruction**
- **No evidence for motivating qualities**

**Wouters, P., van Nimwegen, C., van Oostendorp, H., & van der Spek, E. D. (2013). A Meta-Analysis of the Cognitive and Motivational Effects of Serious Games. *Journal of Educational Psychology, 105*(2), 249–265.**

# Are serious games fun?

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- **Who plays serious games at home because they want to?**
  
  
  
  
  
  
  
  
  
  
- **I asked the same question at a serious games conference...**



# Are serious games fun?

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- ...and nobody raised their hand



# Usability

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- **Engineering mind:**
  - Maybe it's a case of usability and the controls and interaction should be improved?

# Clunkiness

- Most serious games are made by researchers or at least without fun as main goal





Best: 4.7m

QWOP © Foddy.net 2008



THIGHS

0.8 metres



CALVES



# The importance of play

- Persistence and effort, but
- beyond 'mere' engagement
  - Simulation
  - Imagination
  - Negotiation
  - Restructuring
  - Frames of mind
  - Appropriation
  - Persuasion
  - Self-efficacy



# Playful mind



# 21<sup>st</sup> century skills

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- Play is one of the most important new 'learning goals' in educational reform

# HOMO LUDENS



PROEVE EENER BEPALING VAN  
HET SPEL-ELEMENT DER  
CULTUUR  
DOOR  
J. HUIZINGA



# Magic circle

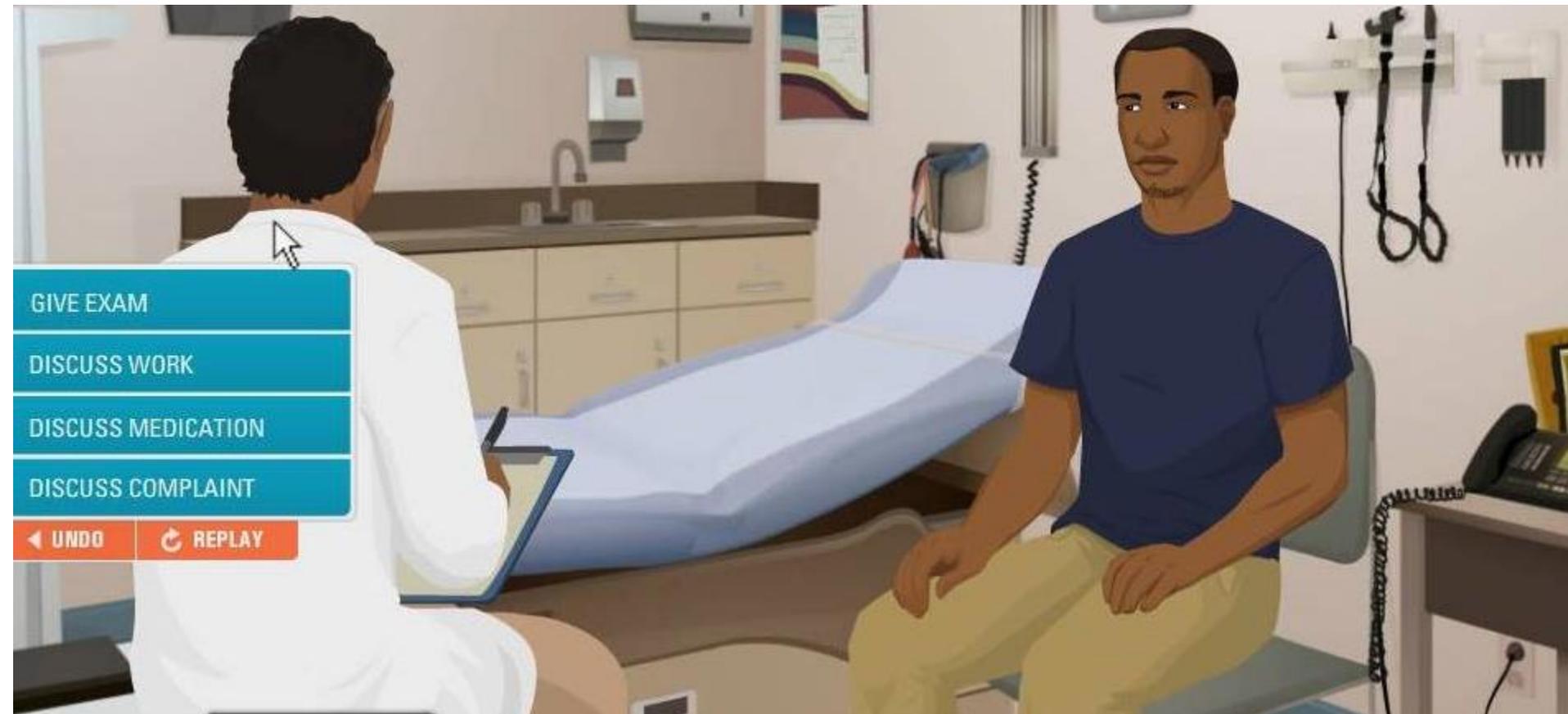
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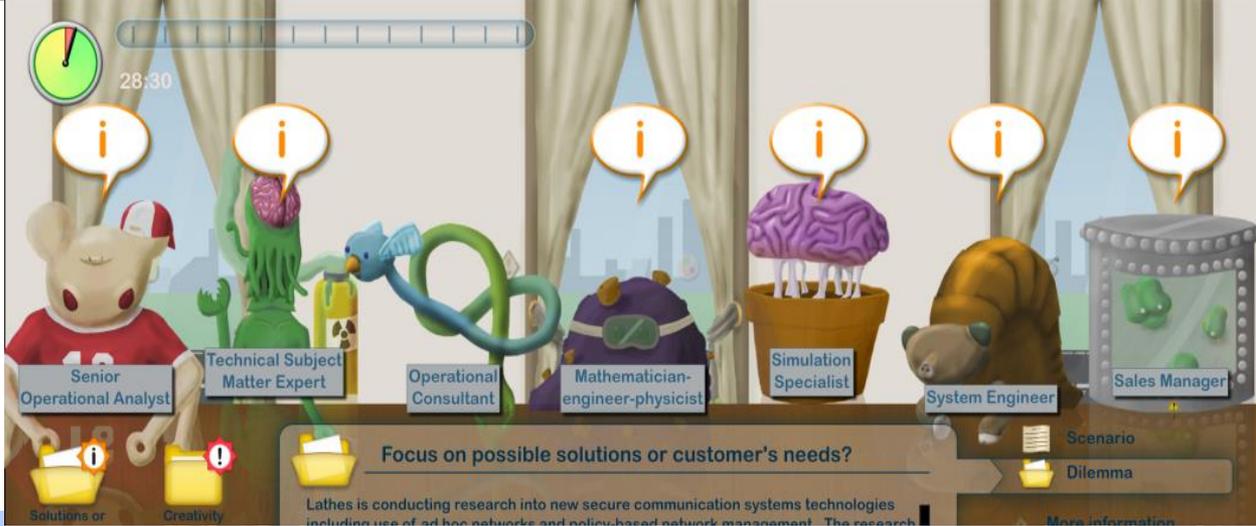
- **A frame of mind you enter volitionally to experiment frivolously**

# Maybe serious games are too serious?

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# Fantasy



# Fantasy

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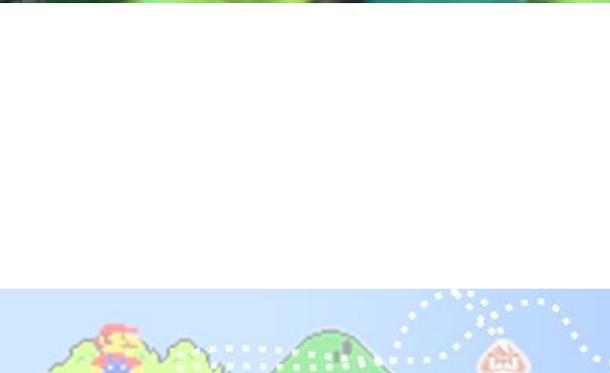
- **Fantasy version was more game-like**
- **But at the cost of learning**
- **So you want to somehow make a serious topic playful**

# Back to my PhD research



# Self-determination theory

- Innate psychological need for competence, **autonomy**, relatedness



# Something else

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- In serious games research on difficulty, people always seem to prefer the easiest setting
- Here people liked making mistakes



# Negotiation space

- There seems to be a desire for a certain negotiation space
- If it's a learning tool, it remains a tool
- But the options seem to have to be non-functional / inefficient



# Loving defects

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# Character



- **New cars are tools and judged by their efficiency; old cars have personality and are loved for their defects**
- **Creates ownership after negotiation**

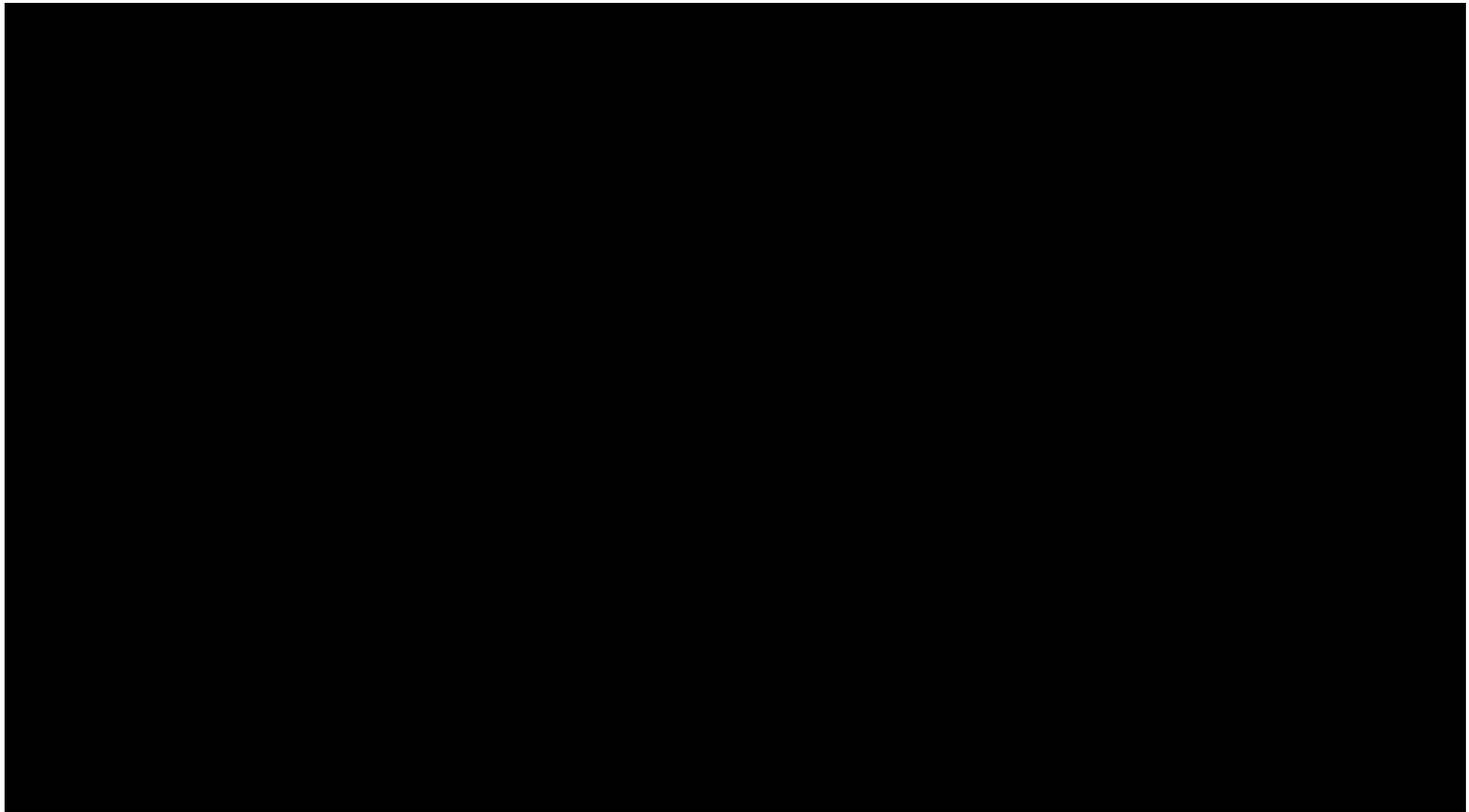
# Student explorations

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# Student explorations

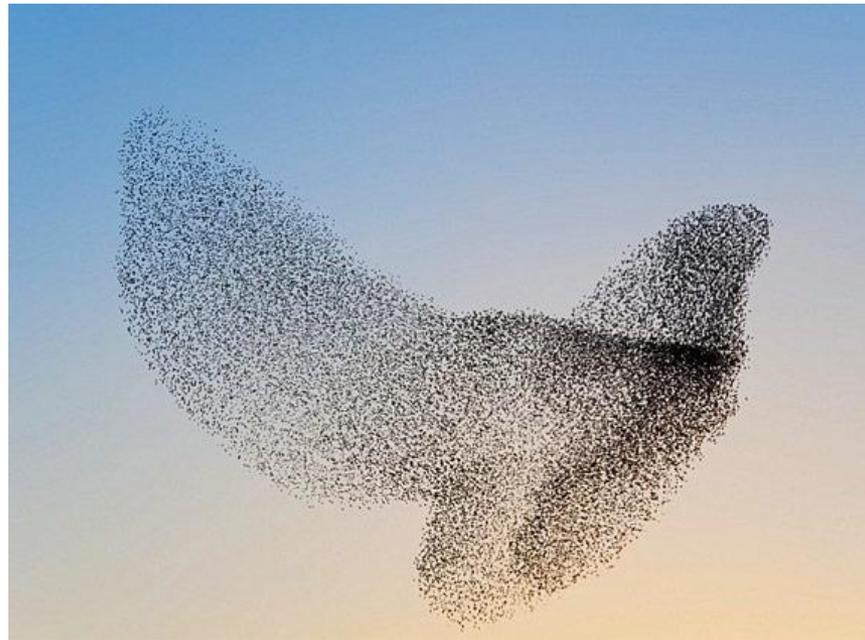
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# Intelligent system

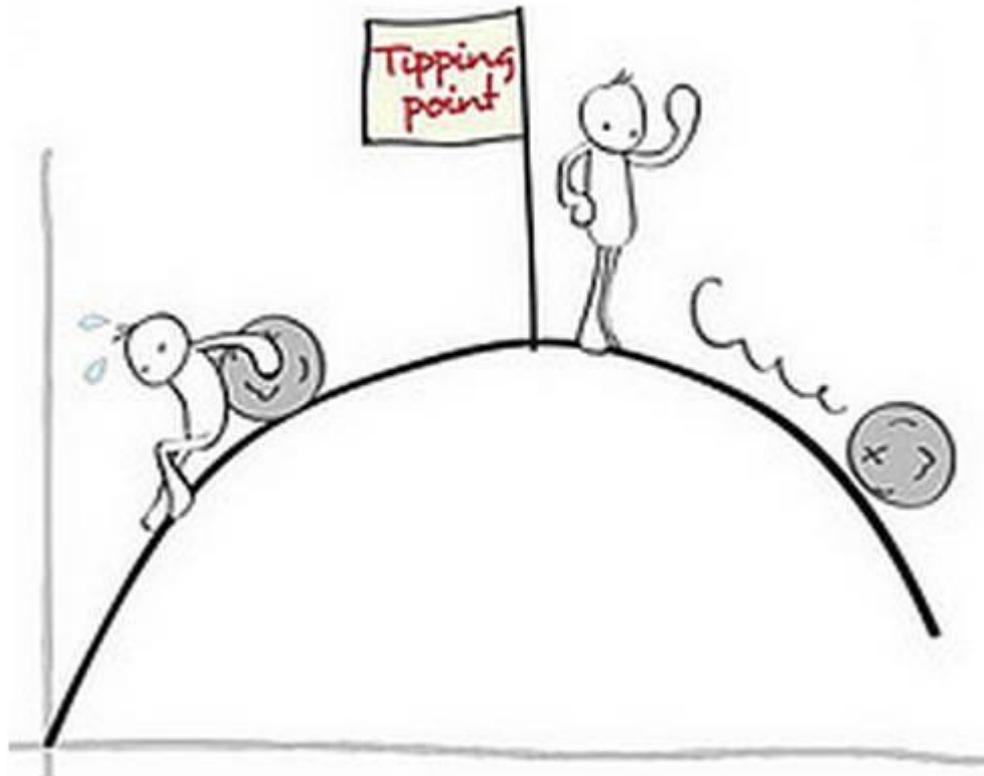
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- Create interesting un/predictability in intelligent systems



# Tipping points

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# Introduce play in activities



# Healthy lifestyle

- Making sports fun can lead to more healthy lifestyle



# Moral of the story

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- **Perfect is boring, you love someone for their defects**
- **It's not a bug, it's play**

