Exploring Games for Learning: A Research Agenda

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99% of boys and 94% of girls play video games.
Games & Play

- **Play—Definition** (Huizinga)
  - irrational
  - a cultural factor in life
  - the direct opposite of seriousness
  - free—voluntary activity, superfluous
  - not ordinary or ‘real’ life

Games

- **Definition of Games** (Huizinga, anthropologist)
  - Outside ordinary life
  - Not serious
  - Utterly absorbing
  - Not connected to material interest or profit
  - Own boundaries of time and space
  - Rules
  - Create social groups that separate themselves from outside world

Learning with Games

- **The Magic Circle**
  - Special place and time created by a game
  - Separated from the real world
  - Finite space with infinite possibilities
  - Luxuriant attitude—arbitrary authority to guide and direct play

Game Genres

- **Genres**
  - First-person shooter (FPS) - Doom, Unreal Tournament, Halo
  - Real Time Strategy (RTS) - Homeworld, Warcraft, Age of Empires, SWAT
  - Role-playing (RPG) - Dungeons & Dragons
  - Action/adventure - Myst, The Legend of Zelda
  - Puzzle - Professor Layton
  - Simulation - SimCity, The Sims
  - Sports - NCAA Football 09, FIFA series
  - Virtual Life / Virtual World - Second Life
  - Massively Multiplayer Online (MMO) - World of Warcraft

Learning with Games

- **Games and Learning**
Learning with Games

**Games and Learning**
- History of Play and Learning
- Games and Literacy
- Games as cognitive spaces
- Games as emotional spaces
- Games as social spaces
- Games as narrative spaces

**What conditions facilitate Learning?**
- Authentic materials, Situated learning
- Meaningful – Narrative
- Engagement through Interactivity
- Focus on problem solving rather than facts
- Adaptive environments
- Social component (collaboration, competition)
- Affective/emotional component

**Educational Game Genres**
- Open-ended simulation (sandbox) games
- Targeted conceptual games
- Professional role-playing games
- Multi-user virtual environments (MUVEs)
- MMOs

**The Learning Circle**
- Special place and time created by a game
- Separated from the real world (?)
- Finite space with infinite possibilities
- (Lusory) **Learning attitude**—(arbitrary authority) educational goals to guide and direct play

**Educational Uses of Games**
- Games to prepare future learning (CCT, Schwartz)
- Mini-games for specific learning goals
- Simulation games for hypothesis testing

**Educational Uses of Games**
- Games turn learner/players into teachers (SL jousting)
- Augmented Reality games for real-life application
- Role-playing games for skills, procedures, etc.
Overview

- Learning with Games?
- Background research
- The Games for Learning Institute
  - Collaborators
  - Research Agenda
  - Design Patterns for Educational Games

Games for Learning Institute

- Collaborators
  - NYU (CS: Perlin, Ed: Plass, Milne; Eng: Isbister, Shelton, Wein)
  - CUNY Graduate Center (Homer)
  - Columbia (Feiner)
  - Teachers College (Kinzer)
  - Parsons School of Design (Macklin)
  - Dartmouth (Flanagan)
  - Rochester Institute of Technology (Phelps)

Games for Learning Institute

- Research Agenda

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- Research Approach

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- Design Patterns for Educational Games

Learning with Games
**Design Patterns**

Action Games enhance visual perception:
- Contrast sensitivity
- Spatial resolution/Visual acuity
- Tracking objects
- Switch between objects

Daphne Bavelier, U of Rochester

**Design Patterns**

Design Patterns for Educational Games:
- Constructing things is fun (World of Goo, Soda Constructor, Fantastic Contraptions, Spore Creature Creator)

**Design Patterns**

Design Patterns for Educational Games:
- Strong Narratives provide sufficient incentive to solve hard puzzles/problems (Professor Layton and the Curious Village)

**Design Patterns**

Design Patterns for Educational Games:
- Time and resource constraints make games fun and can improve learning (World of Goo, Trauma Center)

**Design Patterns**

Design Patterns for Educational Games:
- FPS do not automatically provide incentives to learn (Dimension II)

**Design Patterns**

Design Patterns for Educational Games:
- Games can be engaging without stunning visuals (Tribalwars)
Design Patterns for Educational Games

- A social component (collaboration, competition) makes games fun and engaging (Little Big Planet, World of Goo, Tribalwars, Wii Music)
- Different levels of incentives (e.g., based on player statistics) increase fun and engagement
- Kids will engage in rote tasks for small incentives when it leads up to larger incentives later
- Scaffolding can be used to make games adaptive to learners’ specific needs (prior knowledge, abilities, ...)
- Games can be engaging, even addictive, without being always fun
- The stronger the intrinsic motivation of the game content the less extrinsic motivation is required to engage players

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