Games for Learning Institute
Games for Learning Institute

( What I learned at the

Games
FOR
Learning
INSTITUTE )
Collaborators

Ken Perlin
Bruce Homer
Catherine Milne
Katherine Isbister
Trace Jordan
Joel Wein
Carl Skelton
Mary Flanagan
Chuck Kinzer
Andy Phelps
Miguel Nussbaum
Paul O’Keefe

Yan Wang
Ruth Schwartz
Jon Frye
Yoo Kyung Chang
Lizzie Hayward
Tsu-Ting Huang
Helen Zeng
Charles Hendee
Murphy Stein
Juan Barrientos

**NYU** (Ken Perlin, Jan Plass, **Co-Directors**, Cath Milne)

**NYU Poly** (Katherine Isbister, Carl Skelton, Joel Wein)

**CUNY Graduate Center** (Bruce Homer)

**Columbia** (Steve Feiner)

**Teachers College** (Chuck Kinzer)

**Parsons** School of Design (Colleen Macklin)

**Dartmouth** (Mary Flanagan)

**Rochester Institute of Technology** (Andy Phelps)

**Catholic University of Chile**, Santiago (Miguel Nussbaum)
Computational Thinking
Lots of collaborators/partners

Collaborators

- Board of Advisors
- Faculty from NYU, New York City, National, International
- Network of Middle and High Schools in New York City
- Organizations offering After-School programming
- Media Developers & Broadcasters
- Museums
Science learning games

Adventure Game for Science Learning

- Strong Narrative
- Science Problems Embedded
Simulation games

AR Simulation Game for Science Learning

- Geo-Located Hot Zones
- Authentic Scientific Data feed
Games to practice math skills

Games and Learning

Math Skills: Factor Reactor
Games to practice math skills

Games and Learning

— Math Skills: Supertransformation!
Games are research instruments!

Development Research:

Game prototypes as research instruments

Vary design factors:

- **Social:** solo/competitive/cooperative
- **Emotional:** action/contemplation
- **Ergonomic:** 2D, 3D, form-factor
From game design to learning

- Cognitive Design
- Social Design
- Cultural Design
- Affective Design
- Animation, Simulation, Game, Immersive World
- Learner Variables
- Embedded Assessment, Biometrics
- Cognitive Outcomes
- Meta-cognitive Outcomes
- Engagement
- Affective Outcomes
Learning Mechanics Research

Two learning mechanics:
- Solve missing angles by selecting correct number
- Better: Solve missing angles by identifying correct rule
Example: The math is the game play

TEACHING ESTIMATION:
G4LI game prototype by Mary Flanagan, Nick Fortunato and Frank Lantz
Movement-Based Play (NYU Poly)

A Controlled Comparison of Movement Based Games

In-school study with low/medium/high movement Wii games.

Players rated emotions after each round.

Video coded for manipulation check.

Results

Higher arousal/energy when more movement.

Same amount of positive feelings in all conditions.
Not just grammar -- literature.
“Computer science doesn’t just need a grammar. It needs a literature.”

-Marvin Minsky
Plastic dinosaurs!
Plastic dinosaurs!
Plastic dinosaurs!
Plastic dinosaurs!
Keep a notebook.
Quick sketch for “math is the game play”

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Mash-ups
# Mash-ups

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Computational thinking about chess
Create your own game rules...
Lots of possible games!

- Rook
- Bishop
- Queen
- King
- Knight
- Pawn
Explore by constructing.
Fractal construction kit
Fractal construction kit
Fractal construction kit
Fractal construction kit
Fractal construction kit
Examples of constructed fractals
The importance of personality
Construction kits with personality
Construction kits with personality.
Evolving form factors
Evolving expectations
Use Microsoft Kinect...
...but use it creatively
Fingerpaint games, on any surface
Games with everyday objects

Merve Keles, Murphy Stein, Xin Li, Senem Cinar
Games with everyday objects
Games with everyday objects
Games with everyday objects
Eg: simple fractal rule
3D printing
Make your own game objects
Math objects

Hypercube
can become real objects.

3D printed hypercube zoetrope
Game characters

Character in a learning game
can become real too.

3D printed zoetrope
Collaborative music
Collaborating to tell a story
Bringing it all into our world
Bringing it all into our world
Bringing it all into our world
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Bringing it all into our world
Design groups from the Urban Assembly school

Symphonie, Giselle, Jasmine, Jordan, Kyeana

Lyanna, Taylor, Alex Nicole, Lanisha

Natea, Anna, Javeen, Cheyenne
Farm Animals (Early Designs)
Early prototyping and testing
Digital Prototype

1st Playable Productions
Computational literacy
Play is the key to learning.