CS/INFO 4154: Analytics-driven Game Design

Class 2: Mechanics and Brainstorming
Eventually…
Goal of Paper Prototyping

- Evaluate whether the idea has potential
- Implement the core of the idea
- Do the minimum possible to test it

Pyrokid, 2014
What is a game?
Tracy Fullerton

a closed, formal system
that engages players in structured conflict
and resolves its uncertainty
in an unequal outcome

(Game Design Workshop)
Karen Salen and Eric Zimmerman

a *system* in which *players* engage in *artificial conflict*, defined by *rules*, that results in a *quantifiable outcome*

*(Rules of Play)*
Sid Meier

a series of interesting decisions

(GDC 2012)
Common Threads

- Rules
- Conflict
- Decisions
Common Threads

- Rules
- Conflict
- Decisions
Rules

Game Mechanics

Actions

Interactions
Actions

- **Verbs** that describe what the player can do
  - Walk
  - Run
  - Jump
  - Shoot
- Might not involve an avatar
  - Build
  - Swap
  - Rotate
What are the actions?
What are the actions?
Actions tend to map to a single input

- button press
- key press
- click on something
- drag something
Actions combine

run + jump = jump further

shoot + slide = strafing attack
Game Mechanics

- Actions
- Interactions
Interactions

- Things that happen *because* of an action
- Player does not have direct control
What are the interactions?
What are the interactions?
Game Mechanics

Actions

Interactions
Common Threads

- Rules
- Conflict
- Decisions
Growth in complexity

Plants vs. Zombies
Sense of achievement
Common Threads

- Rules
- Conflict
- Decisions
What are the decisions?
Objective: Simulate

- Rules
- Conflict
- Decisions
Sometimes easy to prototype
Sometimes not…
Discretizing Space
Discretizing Space
Discretizing Time

Turns!
Why is brainstorming important?
Review: making pots

no fame

no fame

lots of fame

1 hour

10 hours

100 hours
Which is better use of time?

make many pots

spend all your time making one awesome pot
What are the tradeoffs?

<table>
<thead>
<tr>
<th>Fewer designs</th>
<th>More designs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Spend more time per design</td>
<td>• Explore more</td>
</tr>
<tr>
<td>• Avoid duplication of effort</td>
<td>• First idea maybe not the best</td>
</tr>
<tr>
<td>• Reach consensus faster</td>
<td>• Play off each other’s ideas</td>
</tr>
</tbody>
</table>
The hypothesis

Source: David Bayles, Ted Orland (2001)
Art & Fear: Observations on the Perils (and Rewards) of Artmaking
Reality

Source: David Bayles, Ted Orland (2001)
Art & Fear: Observations on the Perils (and Rewards) of Artmaking
Larger-scale experiment

“Parallel prototyping leads to better design results, more divergence, and increased self-efficacy”

Steven P Dow, Alana Glassco, Jonathan Kass, Melissa Schwarz, Daniel L Schwartz, Scott R Klemmer

CHI 2011
Scenario 1

Dow et al. CHI 2011
Scenario 1: Share One

Meeting Room

Dow et al. CHI 2011
Scenario 2

Design 1

Best Design

Design 3

Dow et al. CHI 2011
Scenario 2: Share Best

Meeting Room

Final Design
Final Design

Dow et al. CHI 2011
Scenario 3

Design 1

Design 2

Design 3

Dow et al. CHI 2011
Scenario 3

Design 1

Design 2

Design 3

Design 1

Design 2

Design 3

Dow et al. CHI 2011
Scenario 3: Share Multiple Designs

Meeting Room

Design 1
Final Design
Design 3

Design 1
Final Design
Design 3

Dow et al. CHI 2011
Large-scale evaluation
Which did the best?

Share One

Share Best

Share Multiple

Dow et al. CHI 2011
Effect of sharing multiple designs

+5% +15% +25% +35% +45%

Dow et al. CHI 2011
Clicks per million impressions

Dow et al. CHI 2011
1 tip of good design:

Improve your design by 25% by simply using this one weird tip.
Why is *testing* prototypes important?

- **Question**: should you spend time *making* or *testing*?
Egg drop

Dow et al. CHI 2011
Experimental Conditions

Iterative group:
- Design
- Test
- Design
- Test

Non-iterative group:
- Design
Some of the products
### Effect of iteration

<table>
<thead>
<tr>
<th>worse</th>
<th>same</th>
<th>better</th>
</tr>
</thead>
</table>

Dow et al. CHI 2011
Effect of iteration

+25%  +50%  +75%  +100%  +125%

Dow et al. CHI 2011
Maximum height

Iterative | Non-iterative
---|---
6 | 3
Functional fixedness

The Candle Problem (Karl Duncker)
Functional fixedness

The Candle Problem (Karl Duncker)
Key Lesson of this Class #1

Generating, *sharing*, and *testing* multiple ideas leads to *better outcomes*

Ideas are valuable *even if not used*

Take next week seriously!
Brainstorming Technique

- Focus
- **Limit the amount of time**
- Appoint a scribe who will write down ideas
- **Positive** phase
  - Only write down new ideas! Don’t criticize any suggestion.
- **Negative** phase
  - Discuss each idea and reject as a group
- Repeat if necessary
  - But take a break!
  - If done correctly, you will be exhausted.
8/25 Mechanics and Prototyping
8/28 In-class Brainstorming
8/30 Paper Prototyping 1
9/1 Paper Prototyping 2

Attendance will be taken
Assignments 2 & 3: Paper Prototypes

- NOT GRADED!
- Will have Monday’s class to work on this
- Prototype #1
  - due Wed 8/30 (11:00am)
  - (submit a picture)
- Prototype #2
  - due Fri 8/1 (11:00am)
  - (submit a picture)
Game: Video Game Charades

- Topic #1: emotions
- Topic #2: video game problems
Game: Video Game Charades

Actor
Topic 1: emotions
Topic 1: emotions
Topic 2: video game problems
Topic 2: video game problems