

THINK LIKE A GAME DESIGNER:
 TECHNIQUES FOR CREATING LEARNING GAMES



Presented for
The Lilly Conference - Austin
 January 11, 2019

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Why Leave the Games Business?

"This product will offer enough late nights and missed appointments to make it a definite game of the year candidate as well as Exhibit A in many divorce cases."
 — Computer Gaming World

So I had to ask myself...
"What am I doing to people's lives?"

Can I make games that teach something useful?



"Anyone who makes a distinction between games and learning clearly does not know the first thing about either one."
 - Marshall McLuhan



"Game designers have a better take on the nature of learning than curriculum designers."
 - Seymour Papert, MIT

For Example...

What is this cat doing?

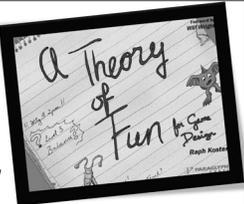
- A. Playing
- B. Learning
- C. Working
- D. All of the above



COGITO ERGO LUDO
 "I think, therefore I play"

Define – What is "Fun"?

"Fun arises out of mastery. It arises out of comprehension. It is the act of solving puzzles that makes games fun. In other words, with games, learning is the drug. ... That's what games are, in the end. Teachers. Fun is just another word for learning."
 - Raph Koster, "A Theory of Fun for Game Design"




"Fun is the emotional response to learning."
 - Chris Crawford, "Chris Crawford on Game Design"

Define – What is a "Game"?

What makes a game a game?

*"A game is a form of art in which participants, termed **players**, make **decisions** in order to manage **resources** through game **tokens** in the pursuit of a **goal**."*
 - Greg Costikyan

"A problem-solving activity, approached with a playful attitude."
 - Jesse Schell, "The Art of Game Design"



"A series of interesting choices."
 - Sid Meier

A game is not...

A game is not a **TOY**

- ▣ Toys are free-form and open-ended.
- ▣ Games have structure, rules, and goals.

A game is not a **PUZZLE**

- ▣ Puzzles are static and have one solution.
- ▣ Games are dynamic and require strategies.

A game is not a **STORY**

- ▣ Stories are linear and passive.
- ▣ Games are non-linear and interactive.

Your First Step to Becoming a Game Designer:

PLAY!

***“When your only tool is a hammer,
every problem begins to resemble a nail.”***

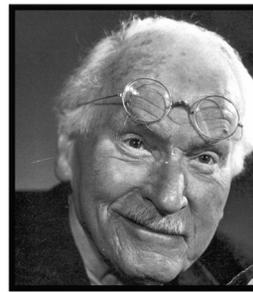
- Abraham Maslow

So, play everything you can –
board games, card games, computer games,
role-playing games, word games, party games, etc.

Who are these people?



Let's Talk About Game Design



*“One of the most difficult
tasks people can perform,
however much others may
despise it, is the invention
of good games.”*

- Carl Jung

Two Types of Learning Games

1. **Frame Games** – Activities where the learning content is completely separate from the game structure. The game is an interactive framework to motivate the learning or testing of knowledge.
2. **Simulations** – Activities that center on simulated use of the skill(s) to be developed. Simulations typically require a model of the situations in which the skills would be used and the variables that affect decisions the player makes.

1. Interactivity / Decision-Making



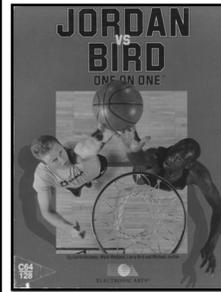
- ▣ Interactivity is like a conversation:
 - You say something (take an action)
 - The game system and/or opponent thinks about what you said and responds (changes the game state and gives you feedback)
 - You think about the new situation and respond (take another action)
 - Repeat as needed
- ▣ More Interactivity = Better Game (it's just that simple)
- ▣ May be many quick decisions or fewer complex ones
- ▣ Players should always be:
 - Thinking about their next decision
 - Making the decision
 - Evaluating the effectiveness of their last decision

2. Game Mechanics

- Mechanics are the game rules - metaphors that translate abstract real world concepts to game objects that can be manipulated.
- Example game objects:
 - Monopoly spaces and property cards
 - Chess pieces
 - D&D character sheets
- Objects can have both static and dynamic values:
 - Properties
 - Behaviors
 - Relationships
- Game Mechanics define how your decisions interact with the game objects.
- Good designers have a large toolbox of game mechanics.

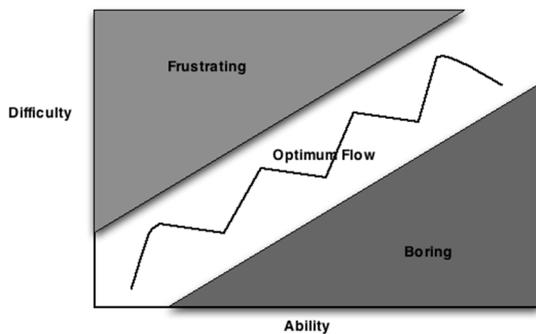


3. Balanced Levels of Challenge



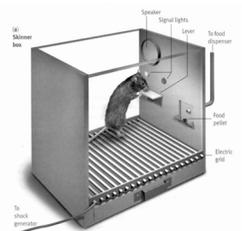
- Would you become a great basketball player by playing against:
 - a) A 5 year old child
 - b) Michael Jordan
 - c) A series of players, each slightly better than you at the time
- Learning comes from facing challenges just slightly better than you are, and devising ways to overcome them
- Challenge can come from:
 - Active opposition (football)
 - Parallel competition (racing)
 - Limited resources
 - Limited time
 - Other limitations
- Tuning the progression of challenge is one of the most important aspects of the playtest phase.

3. Balanced Levels of Challenge



4. Feedback in Game Context

- Skinner was right. Feedback motivates players - period.
 - *"I could get players to happily spend all day chopping down trees with large fish, if I gave them the right feedback and rewards"*
 - Game designer George MacDonald
- Feedback can be:
 - Visual, auditory, text
 - Compliments or criticisms from game characters
 - Rewards that increase player options
 - The look of frustration on an opponent's face
 - Just a shiny badge
- Feedback should usually fit the game fiction.
- Feedback does not always need to be immediate.



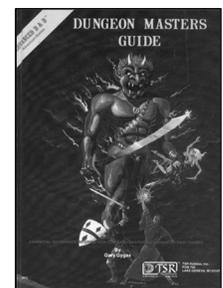
5. Goals and Subgoals



- Football's main goal – Outscore your opponent
 - Subgoal – Score a touchdown or field goal with every possession
 - Subgoal – Advance 10 yards within 4 plays
 - Subgoal – Advance the ball with each play
- Conflicting subgoals create tradeoffs and tension:
 - Your business needs to increase revenue, improve customer satisfaction, and decrease operating costs.
 - Your Sim wants a big house, lots of friends, and a rewarding career.
- Progressions of interlinked subgoals give players a sense of accomplishment, and hook them to play "just a little more."

6. Increasing Options and Abilities

- Examples:
 - "Power-Ups" in video games
 - Bigger weapons in shooter games
 - Character level advances in Role-Playing Games
 - Building houses / hotels once you own a set of properties
 - "Promotion" in a business simulation
- The most effective way to simultaneously set a goal, reward players for achieving it, and increase their challenge moving forward.



7. Resource Management



- Games can have both tangible and intangible resources:
 - *Tangible* - Money, People, Weapons, Ammo, Items
 - *Semi-tangible* - Time, Health/Hit Points
 - *Intangible* - Power, Influence, Reputation, Integrity
- Rich game options come from varying which resources produce which results:
 - **Product A** - Lots of money, few people, moderate time
 - **Product B** - Little time, moderate money, lots of people
 - **Product C** - Little money, moderate people, long time

8. Personalization / Identification



- Do you have a favorite Monopoly piece? Why?
- Increases a player's emotional investment in the game.
- Might have NO impact on game play at all.
- Could be as simple as:
 - Naming your character or team
 - Choosing a specific icon for yourself
 - Selecting a color
 - Picking a face that looks like you

9. Story Elements



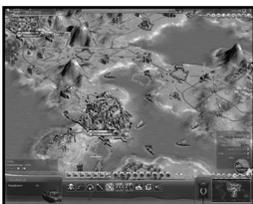
- Three basic elements of story:
 1. Setting - Fairly easy to do
 2. Character - Somewhat harder to do
 3. Plot - Should let the player do
- Important character roles include:
 - Mentors
 - Antagonist(s)
 - Resource providers (Shopkeepers)
 - Information providers (Messengers)
 - Friends / sidekicks
- "Stock" characters can still work effectively in game settings.

10. Social Interaction



- Not part of every game, but will usually make a game more satisfying.
- Can be used for competition and/or cooperation.
- Even artificial opponents can add fun.
- Are most players involved throughout, or do they have to wait their turn?
- Can create interaction outside of game context through high scores, discussion boards, chat, etc.

11. Exploration / Discovery / Mystery



- Curiosity is one of the strongest motivations there is.
 - Why else would we spend six years watching *Lost*?
- Does not necessarily mean exploring a large landscape. Can also mean:
 - What will my new office look like?
 - Who will I meet next?
 - What new powers / options will I learn?
 - What events will occur?
 - What type of Pokemon will pop up next?

12. Predictable Risks



- Unpredictable events increase replayability
- Can simulate environmental factors like weather and the stock market
- Managing risk is an important skill
- Can help balance those ahead / behind
- Apply randomness carefully - The more randomness you have, the less players feel in control.
- Use it like a spice to "kick it up a notch"

A Simple Model of Game Development

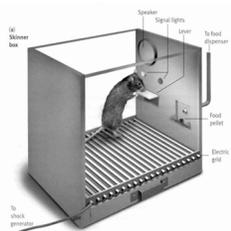
1. **Player Decisions and Actions**
2. **Feedback**
3. **Goals**
4. **Resources and Mechanics**
5. **Challenge Curve and Variations**
6. **Playtest**

1. Player Decisions and Actions

- What are the skills the player is learning?
- What are the verbs – the actions that a player can take involving those skills?
- What decisions does a player make regarding the skill?
- What situations, resources, and other factors influence those decisions?
- What can influence a good player to make a bad decision?



2. Feedback



- How do you evaluate what is a bad decision, a good decision, and a great decision?
- Is the evaluation objective or subjective?
- How will these outcomes change the game state?
- Does it merely change a score, or does it impact the player's resources, future options, etc.?
- Is the feedback immediate or delayed?

3. Goals

- What triggers the end of game - A score, a time limit, x number of turns, running out of money?
- Is the game cooperative or competitive?
- What mechanism drives the game forward towards those goals?
- How do you determine the winner or winners?
- Are there sub-goals that mark progress along the way?



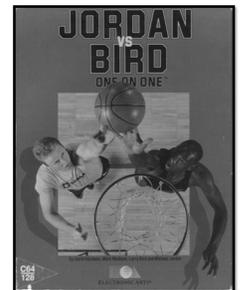
4. Resources and Mechanics



- What resources does a player have to use – turns, money, workers, other players?
- How are the player's resources earned / used / changed by the player's actions?
- Do the resources have relationships to each other?
- What are the physical representations for the game – A Board? Cards? Dice? Tokens? Markers?

5. Challenge Curve and Variations

- What will make the game easier or harder for a player?
- How will variations in scenarios, resources, options, other players, etc. impact the difficulty?
- How many meaningful variations on resources, scenarios, etc. can you brainstorm?
- Is the game long enough to need an increasing challenge curve?
- Will you order those variations in ascending difficulty or let them come at random?



6. Playtest

THIS IS WHERE THE REAL LEARNING GOES IN!



- Test with a variety of players – both experienced and naïve
- Does intuition and common sense work for players?
- Do the winning strategies fit your learning objectives?
- Are there "stupid" strategies that actually work?
- Do players focus on the decisions that are important to the learning?
- Are there decisions that are always made the same way? Why?

6. Playtest

"Tuning is nine-tenths of the effort."

- Will Wright
Designer of *Sim City* and *The Sims*



Example - The Confidence Game

1. Divide into three teams. Decide on a name for your team.
2. When it is your team's turn, draw a "**Confidence Challenge**" card. Your team will act as "Judge". Read your challenge out loud to the other teams.
3. The other two teams have 30 seconds to come up with an effective, confident, yet diplomatic response to your challenge.
4. One person on each competing team stands and delivers their response, as if in that situation. Body language, facial expression, and verbal tone also count.
5. The Judge team decides which team gave the better response. They should explain why they chose the winning team.
6. The next team clockwise then becomes Judge for the next challenge.
7. We will play as many rounds as time permits.

Questions?

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(PS: I am glad to brainstorm and consult on learning game design.)

Appendix A: 6 Recommended Games

1. **Apples to Apples** – A fun family card game
2. **Catan** – Focuses on resource management and trading
3. **Fluxx** – A flexible game with ever-changing rules
4. **Pandemic** – Cooperative game
5. **Betrayal at House on the Hill** – A good storytelling structure
6. **Power Grid** – A good business / economics model

Appendix B: 5 Recommended Books

1. **A Theory of Fun for Game Design** – Raph Koster
2. **Design Your Own Games and Activities** – Sivasailam Thiagarajan ("Thiagi")
3. **Thiagi's 100 Favorite Games** - Sivasailam Thiagarajan ("Thiagi")
4. **The Art of Game Design: A Book of Lenses** – Jesse Schell
5. **Reality is Broken** – Jane McGonigal