808
Using Game Mechanics to Design Serious Games

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I'M TARA.

I like games.
THE POWER OF GAMES
1.2 Billion

Number of people worldwide who play games

Source: Spil Games State of the Industry Report
700 Million

Number of people worldwide who play *online* games

Source: Spil Games State of the Industry Report
46% women

54% men

Source: Spil Games State of the Industry Report
150 Million Americans play video games

Source: Entertainment Software Association
China and the U.S. are amongst the global leaders in video game revenue.

China 2016 Video-Game Revenue: $24,271,294,000

U.S. 2016 Video-Game Revenue: $23,459,093,000

Source: Big Fish Games
Application of elements of game play to a non-game situation (e.g., points, time, badging, rewards).

Gamification has motivational components, not always learning components.
GAME-BASED LEARNING

A *method* of learning that uses games to enhance the learning experience with defined learning outcomes. It balances subject matter with gameplay.
SERIOUS GAME

A game designed with a purpose other than entertainment. Can also be considered a type of game-based learning. “Serious” is generally used to refer to video or more complex games (e.g., LeapFrog, etc.)
Deconstruct the fun in any good game, and it becomes clear that what makes it enjoyable is the built-in learning process.

- Jessica Trybus, New Media Institute
To progress in a game is to learn.

- Encourage Discovery
- Forced to Interact
- Actively Engaged
- Immediate Feedback
- Motivated
- Constant Decision-Making

Games > Gamification
WHAT’S IN A GAME?

Terminology in ludology and gaming differs from source to source.
The *Game Goal* is the win state or the objective of the game. This is any achievement or activity that ends the game.
GOOD GAMES HAVE FOUR COMPONENTS

Core Dynamics are what players must do to achieve the goal. Most games have 1-2 core dynamics.
GOOD GAMES HAVE FOUR COMPONENTS

Game Goal

Core Dynamics

Game Mechanics

*Game Mechanics* are the rules or what define how people achieve the game goal.
Good games have four components:

- **Game Goal**: The objective or purpose of the game.
- **Core Dynamics**: The underlying rules and mechanics that govern the gameplay.
- **Game Mechanics**: The systems and sub-systems that support the core dynamics.
- **Game Elements**: The components that enhance the game play and immerse the player(s) in the game (visual aesthetic, theme, rewards, resources, etc.).

*Game Elements* are the components that enhance the game play and immerse the player(s) in the game (visual aesthetic, theme, rewards, resources, etc.).
MUST WORK TOGETHER
You can have a great game goal, but if you have bad mechanics, the game won't be engaging.
...it is the mechanics of a game – not the theme – that make it fun.
- Zichermann and Cunningham
RELATIONSHIP

Game Mechanics should have an appropriate relationship to the content and other components of the game design.

Source: YouTube-Designing Digitally
INTERACTION

Vary the length, difficulty, and completion time of your interactions or challenges.

Configure interactions or challenges based on the actions and behaviors you’re tracking or looking to change through the game (i.e. interactions + relationships).

Source: YouTube-DinerDash
Interaction of Game Mechanics determines the complexity of the game and the level of player interaction in the game.

Source: (top) Propietary, (bottom) YouTube-Designing Digitally
Encourage failure – failure is a good thing. Allow players to start from the last saved area when they fail. This encourages them to take risks, explore, and try new things.
Game players rarely know all the rules.

Game Mechanics should encourage a player to explore and learn through the use of feedback mechanisms or feedback loops.
FEEDBACK LOOPS

player performs an action

the action causes an effect

the player receives feedback

the player performs another action using what they’ve learned
APPLYING GAME MECHANICS
Game Mechanics are just one part of your overall game design.
To progress in a game is to learn.

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DESIGN IS CRITICAL

See how technology is not mentioned here? That’s on purpose.
## 4 principles of a well-designed game

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<thead>
<tr>
<th><strong>SUBSET PRINCIPLE</strong></th>
<th><strong>ACTIVE, CRITICAL LEARNING PRINCIPLE</strong></th>
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<tbody>
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<td>Takes place in a simplified subset of the real domain. It should omit unimportant details so that players can focus on the simulation aspects relevant to the learning objective.</td>
<td>Environment must encourage active and critical learning. Players do not “watch” examples, but rather think, act, and experience consequences.</td>
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<th><strong>PROBING PRINCIPLE</strong></th>
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<td>A cycle of doing something, reflecting on this action, and forming a hypothesis to re-experiment (using feedback loops).</td>
<td>Players get a lot of practice in context (where practice is not boring). This keeps players engaged and encourages them to develop good habits.</td>
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QUESTIONS?
THANKS

Don’t forget to complete the survey!

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RESOURCES

◇ James Paul Gee, *What Video Games Have to Teach Us about Learning and Literacy*
◇ [https://www.gamedesigning.org/learn/basic-game-mechanics/](https://www.gamedesigning.org/learn/basic-game-mechanics/)
◇ Sharon Boller and Karl M. Kapp, *Play to Learn: Everything You Need to Know About Designing Effective Learning Games*
◇ [https://www.td.org/Publications/Newsletters/Learning-Circuits/Learning-Circuits-Archives/2011/02/Barriers-to-Adopting-Games-in-Corporate-Environments](https://www.td.org/Publications/Newsletters/Learning-Circuits/Learning-Circuits-Archives/2011/02/Barriers-to-Adopting-Games-in-Corporate-Environments)
VIDEO RESOURCES

◇ Video Links:
◇ Diner Dash: https://www.youtube.com/watch?v=sflKaX8Un98
◇ Designing Digitally: https://www.youtube.com/watch?v=iT3KOqcgoe4&list=PLP1WrNbxRvD2nCqZN0AeBQpKPr4q7T4&index=8
◇ Designing Digitally: https://www.youtube.com/watch?v=Ef_vAi1h13pU&index=10&list=PLP1WrNbxRvD173BjCSJBi4tLxfG0qwzY9
◇ Uncharted 4: A Thief’s End: https://www.youtube.com/watch?v=_r3YTwD.bqw <note: graphic scenes>
◇ Super Mario Bros.: https://www.youtube.com/watch?v=KeZCtI0XuwM