CHAPTER II

LITERATURE REVIEW

2.1. Gameplay Design Theory

At it's base, a game is "*a type of play activity, conducted in the context of a pretended reality, in which the participants try to achieve at least one arbitrary, nontrivial goal by acting in accordance with rules*" (Adams, 2012). According to McGonigal (2011), when games are stripped to their bare basics, there are four traits that define a game and differentiate between games and other game-like activities. The four traits are the goal, rules, feedback system, and voluntary participation. These four traits are the core aspects that define games as games, and other elements such as victory, defeat, scores, and other common game terms are derivatives of these traits.

Game design, to put it simply, is "*the act of deciding what a game should be*" (Schell, 2008). Game design is every aspect of the game, including the gameplay, the visuals, the sounds, the animation, the interface, and many more. The *Oxford Advanced Learner Dictionary* (2015) defines gameplay as "*the features of a computer game, such as its story or the way it is played, rather than the images or sounds it uses*". Defining gameplay as the part of game design that dictates how the game is played, it can be concluded that gameplay is comprised of the traits that form a game itself: goal, rules, feedback system, and voluntary participation.

2.1.1. Goal

Goal refers to the end point that the game's participants, as players, strive to reach. The goal provides players with a sense of purpose inside the game. Without a goal, a game doesn't have any way to gather players' focus and attention towards their action and participation inside the game. Terms such as 'win', 'victory', and 'beating the game', commonly used in game contexts, refer to successfully reaching the game's goal, while terms like 'lose' and 'defeat' signify the game ending in a way that players don't reach the game's designated goal (McGonigal, 2011).

2.1.2. Rules

Rules are a limitation that exists as obstacle between the game's players and it's goal. Rules provide players with an opportunity to express their skill, creativity, and strategic thinking. The rules that work properly are the rules that encourage players to explore each possibility in the game in pursuit of the game's goal by obstructing the easiest, most obvious way to reach it (McGonigal, 2011).

2.1.3. Feedback System

Feedback system takes the form of an indicator for players in order to provide information about the player's overall progress towards reaching the goal, as well as hints on reaching that goal according to the game's rules. Feedback system works as a motivation for players to continue playing the game by bridging players to the goal and making sure players can grasp the concept of that goal (McGonigal, 2011).

2.1.4. Voluntary Participation

Voluntary participation requires that all players that participate in the game fully understands and accepts the game and the goal, rules, and feedback system in it's design. While voluntary participation isn't a trait deliberately designed a certain way by a game designer, voluntary participation is a common yet important trait to give the game design more room to design and develop, as voluntary participation guarantees that the challenges in the game are consensually accepted by the players in order to provide genuine fun to the players (McGonigal, 2011).

2.2. Fullerton's Game Theory

The *Game Design Workshop* book by Tracy Fullerton (2008) provides an alternative view on what defines a game. According to Fullerton, there are three elements that make up a game – formal elements, dramatic elements, and system dynamics. The main difference between McGonigal's and Fullerton's game theory is that while all of the traits that make up a game in McGonigal's theory count as gameplay, the same cannot be said for Fullerton's theory.

2.2.1. Formal Elements

Formal elements are the basic building blocks that make up a game. Formal elements are the main components in a game's playability, and without them, the game will be outright unplayable (Fullerton, 2008). There are many examples of formal elements, all of which are essential for a game to be playable. The existing types of formal elements are players, objectives, procedures, rules, resources, conflict, boundaries, and outcome.

Applying McGonigal's game theory (2011), the objectives can be considered as the goal, as objectives provide the players a goal to chase for as they play. The rules exist and are mentioned in both theories. Therefore, it can be concluded that the formal elements in Fullerton's theory refer to the traits of a game in McGonigal's theory, and therefore, the formal elements are what makes up the gameplay.

As lenticular design is a method of game design which is applied explicitly to the gameplay of any given game, the component which is affected by lenticular design is the formal elements. In Rosewater (2014)'s theory, the gameplay elements that contain lenticular design are the cards in *Magic*, which are a form of resource. However, lenticular design can also be applied to any of a game's formal elements.

2.2.2. Dramatic Elements

The dramatic elements of a game are the elements that support the game's formal elements by adding an emotional factor into the formal elements. These dramatic elements take multiple forms, many of which are crossed over with different disciplines – for example, adding a story, visuals, and character designs to an existing action game with only it's formal elements can provide players with more engagement with the game. Dramatic elements include examples such as story, sounds, and animation – therefore, dramatic elements are not part of the gameplay (Fullerton, 2008).

As the dramatic elements refer to the non-gameplay elements in a game's design, dramatic elements are not where lenticular design is applied.

2.2.3. System Dynamics

Rather than an individual element all it's own, the system dynamics of a game can be defined as a group of multiple different elements that interact together and are joined together to achieve a specific purpose. System dynamics are an important part of game design because games are systems themselves – in well-designed games, the elements of a game work together dynamically to create an experience greater than the sum of it's parts. As the system dynamics are the 'joints' between the game's elements, system dynamics are also included in the gameplay (Fullerton, 2008).

The system dynamics themselves do not contain lenticular design. However, as system dynamics refer to how other elements interact with each other, the system dynamics can result in elements with lenticular design interacting with other elements, with or without it.

2.3. Game Mechanics Theory

A game's mechanics, particularly in video games, can be seen as a manifestation of the game's goal and rules. A game's mechanics are a reflection of what actions players are allowed to do in the game, and what reactions the game itself will give to the player based on that action. In *Super Mario Bros.* (1983), the player character is able take action by walking horizontally, and when the player character moves to the right with enough distance, the game reacts by scrolling the screen to the right, locking out some of the previously available space. This is an example of a game mechanic.

Whereas rules are written and recognized, mechanics don't need to be understood before a player can start playing. A game of *Super Mario Bros*. doesn't begin with the game explaining all of it's mechanics – it begins with the player character in a two-dimensional level, and the player holding a controller, with freedom to press buttons on that controller and see what action their player character takes, and how the game treats it.

2.4. Types of Games Based on Media

Based on the media used to present it, there are two types of games; tabletop games and video games.

Tabletop games, commonly referred to in Indonesia as board games in a blanket term, are games that are generally played on a flat surface, typically a table. There are many different types of games that are classified as tabletop, such as board games, card games, and role-playing games. The main differences are the media used, such as boards, cards, dice, character sheets, and many more (Image 2.1).

Image 2.1. *Monopoly* (1935), one of the most well-known tabletop games (Hernandez, 2019)

Video games, commonly referred to in Indonesia as digital games, are defined as “a game played by electronically manipulating images produced by a computer program on a monitor or other display” (Oxford University Press, 1989). There are also different possible medias for a video game, such as computers or consoles manufactured specifically for playing video games.

2.4.1. Video Game Theory

The key defining features of a video game is a visual monitor to show players the objects in a game and a receptor that players can use to interact with objects in that game. As long as these two factors are present, a game can be considered a video game. An example of this is a phenomenon that began in 2016, where hackers began finding a way to play the classic shooter Doom (1993) on multiple devices that are typically not used for playing games (Image 2.2).

Image 2.2. Doom (1993) can be played on multiple devices (Kotzer, 2016).

What makes video games unique as a media is the types of interaction available to players that can't be replicated with non-digital medias of games. In a tabletop game, players often are required to understand the rules of the game firsthand before being able to fully enjoy it. The process to understand these rules may vary between simply reading a rulebook and even requiring to play a few warm-up sessions of the game. In video games however, rules don't necessarily need to be taught to the player before the player is able to play and enjoy the game. Video games teach players during their playtime, eliminating the need for preemptive knowledge of the game's rules (Adams, 2012). This is thanks to video games' more limited nature, as the players' interaction method are already severely limited by the use of controllers as a transmitter between players and game objects, as opposed to the direct interaction present in tabletop games.

Video games also bring unique forms of interaction that can't be replicated directly using tabletop objects. While playing *Solitaire* with physical playing cards requires proficient shuffling technique to make sure the cards are properly randomized, the *Microsoft Solitaire* (1990) provides a more practical and comfortable flow by using computer algorithm to randomize the cards. Another example that shows the unique possibilities a video game can provide is *Eternal Card Game* (2016). Built on the foundation of the tabletop game *Magic: The Gathering* (1993), *Eternal* is designed with many of the same elements of gameplay and a similar flow. What differentiates *Eternal* from *Magic* is the game mechanics that take advantage of the game's digital nature. One prime example is the *Warcry* ability, which allows players to increase the strength of the next *unit* card they draw,

unit cards being parallel to *Magic*'s *creatures*. In a physical card game, emulating this game mechanic would require players to somehow constantly reveal the cards they draw, in order to confirm which card is strengthened. This takes away the game's strategic elements to an extent, as hidden information is part of what gives the game depth. However, thanks to it's digital nature, *Eternal* can simply have the game's programming do the job for the players, eliminating the need to reduce the depth of the game.

2.5. Multiplayer Games

At it's base, a multiplayer game is a game which is played by two or more participants (Image 2.3). Multiplayer games take many forms, depending on how the game is designed and the types of interaction that the game allows. According to Fullerton (2008), there are five types of multiplayer interaction patterns. *Player versus player* is a pattern where two players directly attempt to reach the objective of the game conflicting with each other. *Multiple individual players versus game* is a pattern where two or more players attempt to reach an objective common between all players without directly interacting with each other. *Unilateral competition* is a pattern where two or more players cooperate competing against one player to reach the game's objective. *Multilateral competition* is a pattern where three or more players directly conflict with each other in reaching the game's goal. *Cooperative play* is a pattern where two or more players work together to achieve a common goal. Lastly, *team competition* is a mix between *player versus player* and

cooperative play, where two groups of player, each group consisting of at least two players, directly conflict against each other to reach the game's objective.

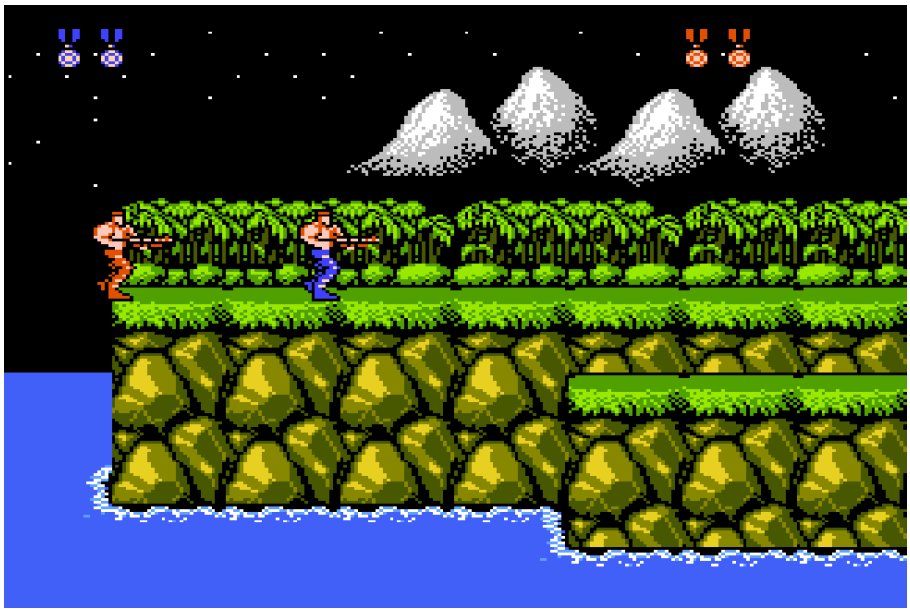

Image 2.3. *Contra* (1987) is an example of a game that can be played as multiplayer.

Multiplayer games have the appeal of replacing elements and factors of a game – normally controlled by part of the game design itself – with a human. The most fun games are uncertain in it's outcome (Adams, 2012), and humans have the ability to provide immense unpredictability into a game's design. Humans as players have the ability to learn and change, and the number of different possible humans as other players also provide different interactions that can't be replicated in a single player game where the player simply interacts with elements of the game design.

2.5.1. Competitive Game Theory

According to philosopher James P. Carse (1986), games can be divided into two types, finite games and infinite games. Finite games are games that have an end,

where players play to achieve the desired outcome normally defined by winning, and infinite games, where players simply play until they reach the inevitable outcome. Competitive games are a type of finite multiplayer game where other player(s) is/are the most influential obstacle between each player and the goal, and every action taken towards the goal directly or indirectly hinders other players from reaching that goal. Competitive games can come in many forms of interaction, such as one-on-one like *Street Fighter 2* (1991) (Image 2.4), a group of players against another like *Dota 2* (2013), or in the *battle royale* genre's case, a free-for-all interaction where more than two players go against each other. Without any interaction between players in a form that directly or indirectly obstructs other parties from reaching the game's goal while still playing within the game's rules, a game isn't considered a competitive game.

Image 2.4. *Street Fighter 2* (1991), a competitive game played between one player and another (Howard, 2019)

According to an academic journal by Alexander (2014), a competitive game's gameplay design has it's own qualities that determine how well-designed the game is in a competitive environment.

2.5.1.1. Depth vs Complexity

Well-designed competitive games must have a lot of depth. According to *Game-Wisdom*'s owner Josh Bycer (2017), depth can be defined as the number of possible options that a player can take while playing the game at any given point, and how much a player needs to improve at the game before they can be considered to have mastered the game (Alexander, 2014).

A lot of the time, depth is confused with complexity, but while the two are related in a way, they are two different principles. Complexity refers to the amount of elements that a player needs to understand before understanding the game at a basic level. Depth is subtle and reveals itself when a player gains enough proficiency and knowledge, while complexity is more obvious the moment a player starts the game.

Nolan Bushnell, the founder of *Atari*, says that "*All the best games are easy to learn and difficult to master. They should reward the first quarter and the hundredth*" (1971). This quote is known as *Bushnell's Theorem*, and many game designers have embraced this theorem as a principle in their game design, most notably *Blizzard* (Wolfshead, 2007). While this principle is true for every game, it is especially important in competitive games, as when a game doesn't have enough depth to explore, it's easy to find the one most efficient way to win every game –

and once that happens, more and more players will begin adapting the same strategy, which oversaturates the game with the same type of obstacles over and over, taking away the uniqueness of the human factor. Understanding the definitions of depth and complexity, it can be concluded that the ideal games are games with low complexity and high depth (Alexander, 2014).

2.5.1.2. Skill Factor

In a competitive game, skill must play the biggest and most significant factor in the outcome of the game. The design of the gameplay must provide space for all players to dictate the course of the game, as every player in the game is every other players' obstacle. Other factors, such as luck, are allowed to be part of the deciding factor and can even improve the experience, however in a well-designed competitive game, skill must take precedence by a large margin (Alexander, 2014). When players feel like they don't have enough control over the game, they will be more inclined to feel frustrated and dissatisfied, as wins become less of a personal factor and losses happen for reasons aside from skill difference.

2.5.1.3. Change and Evolution

Change is an important part in sustaining a competitive game. A game that doesn't change and evolve is a game that stagnates, and when a competitive game stagnates, the game inevitably grows closer to a solved state. A solved game is a game in which the outcome is determined as soon as it is played (Allis, 1994). By introducing change and evolution into a game, the intricacies of the game and the different interactions will change, effectively unsolving the game.

Evolution in games can appear in the form of new contents that make new strategies possible, or in the form of changes to existing contents to change the balance between the possible strategies in the game (Alexander, 2014).

2.5.1.4. Lenticular Design

The term "lenticular design" was first coined by Mark Rosewater, lead designer of the trading card game *Magic: The Gathering* (1993). The term was used to describe cards in *Magic* that "appear on their surface to be very simple, but once you understand more about how to use them, they become more complex" (First Person Scholar, 2015). The term itself was named after lenticular images, which are images that appear differently from different angles (Image 2.5).

Image 2.5. Lenticular images (Robin3D, 2015)

Lenticular design in games is a game design principle where an object, strategy, or game mechanic in a game can give off different images and suggest

different kinds of applications depending on the player's perspective. Often times, in order to allow players new to the game to comprehend the game more easily, while still allowing complexity to remain in the game and add to the game's depth – therefore this perspective is based on each player's knowledge of the game. For example, a character in a *multiplayer online battle arena* game can appear weak to beginners and less skilled players, but professional players who have better teamwork with each other see the character as a stronger pick (Alexander, 2014) This creates complexity in the gameplay which is invisible to less experienced players, allowing them to be less overwhelmed and frustrated by the true difficulty of the game, which is too high for newer players.

Mark Rosewater (2014) cites three types of complexities that exist in *Magic*, which can be applied to game design in different game genres: comprehension complexity, which refers to understanding how an element of the game functions; board complexity, which refers to understanding the way the gameplay elements interact with each other; and strategic complexity, which refers to understanding the ways a game design element can be used. In lenticularly designed game elements, the player's perspective changes are proportional to their understanding of one or more of these types of complexity. This change in the player's perspective is used for the purpose of hiding these complexities from new players in order to allow them to familiarize themselves with the game first, without omitting the complexity that gives depth to the game.

In order to gain a deeper understanding of the lenticular design concept, it will prove useful to study how lenticular design affects the game where the term is

first coined – *Magic* itself – and the cases in the game in which lenticular design is applied and has an effect on the game. According to Mark Rosewater's article on lenticular design in 2014, one of the cards in *Magic* where lenticular design is most apparent is the *Black Cat*, as shown below (Image 2.6)

Image 2.6. *Black Cat*

Black Cat is a card that, with it's mana cost of only 1 neutral and 1 black – with a total of 2 – can be played relatively very early into the game. *Black Cat* has an effect that allows the player to force their opponent to discard a card randomly when it dies, which punishes the opponent for removing it. According to Rosewater (2014), a card such as *Black Cat* might appear differently to players of different skill levels and experience in the game. It's effect of punishing the opponent for it's removal is the component of the card which defines the card, yet to a newer player,

the card would appear as if it's effect is only an additional bonus, with it's main appeal being that it's simply a creature. It takes the player an amount of experience and understanding of the game to understand the value of *Black Cat*'s effect, which exceeds it's value as a creature card. This cements *Black Cat* as an example of strategic complexity in lenticular design, where player perspective changes as they understand how a game element can be applied to their advantage.

Another *Magic* card that can be studied as an example of lenticular design is *One with Nothing*, as shown below (Image 2.7)

Image 2.7. *One with Nothing*

Comprehension complexity refers to the player's understanding of what a gameplay element does and how it functions. When a new player lacks their understanding of a gameplay element's comprehension complexity, they come into

a proverbial wall, where they are stopped in the middle of attempting to understand the element before making use of it. However, such an effect can also be achieved with a card such as *One with Nothing*, an instant costing 1 black mana which causes the player using it to discard all the cards in their hand. Seeing as the hand is an important resource in *Magic*, combined with the fact that *One with Nothing* only discards the player's hand without any noticeable benefit, less experienced players would often fail to comprehend *how* such a card would benefit them (Rosewater, 2014).

While the two cards above are examples of strategic complexity and comprehension complexity respectively, *Prodigal Pyromancer* (Image 2.8) is an example of a card in *Magic* with board complexity.

Image 2.8. *Prodigal Pyromancer*

At it's core, and on first sight, *Prodigal Pyromancer* is an easy card to understand – a creature costing 3 mana, which in each of the player's turn, has the option to tap itself to deal 1 damage to a target creature or player, rather than tapping it to use it as an attacker like how creatures typically function. However, *Prodigal Pyromancer*'s simple effect has the potential to change the calculations of any existing board; in *Magic*, whenever a player attacks, the opponent is the one that decides where the attack will land, as they choose whether to block – and if they do, with which creature – or not to block, and simply to let the attack land directly to the player. However, with *Prodigal Pyromancer*'s effect, the attacker – in this case, the player tapping *Prodigal Pyromancer* – is the one that decides which card, or which player, takes 1 damage from this card's effect. This creates a lot of possible interaction patterns with other cards, as this card can either be used as a ticking time bomb dealing 1 damage directly to the opponent every turn, or in order to remove 1 toughness from any creature (Rosewater, 2014).

These three cards are examples of lenticular design in *Magic*, which is the game cited as an example by Rosewater (2014) who first coined the term. By using these cards as a point of reference, the principles of lenticular design can then be applied in video games of other genres.

2.5.1.5. Fun in Competitive Games

The final key to success in competitive games is fun. For a competitive game to be successful, fun must be a high priority in the design of it's gameplay. If a game isn't fun and exciting, there will be less incentive for players to play the game, and the game will slowly lose it's success.

A theory by Mihaly Csikszentmihalyi (1990) explains about a state called *flow*, which is a state where a person is fully invested in an activity. This state is felt even more in activities that require creativity, such as playing a video game. Csikszentmihalyi quotes that "the best moments in our lives are not the passive, receptive, relaxing times… The best moments usually occur if a person's body or mind is stretched to its limits in a voluntary effort to accomplish something difficult and worthwhile" (1990, p.3). He believes that the *flow* state is closely related to the concept of happiness and fun, and is the main reasoning behind how a person can feel fun (Alexander, 2014).

In activities, the *flow* state is achieved when the skill of the person who's performing an activity and the challenge of that activity are balanced with each other. In the context of games, in order for the player to achieve the *flow* state, the challenge presented in the game must be in proportion with the player's skill (Image 2.9). Since the majority of challenges and obstacles in competitive games comes from other players, maintaining fun in competitive games means involving a system that makes sure that players are matched against other players who are of a similar skill level. In modern online games, this is often built into a system called *matchmaking*, which is a system made for automatically matching different players into the same game session (Marin, 2014). The game keeps track of values associated with each individual player which changes based on their performance. Then, in *matchmaking*, players are matched with others with similar values, increasing the chances that players will be playing against others with similar skill level (Alexander, 2014).

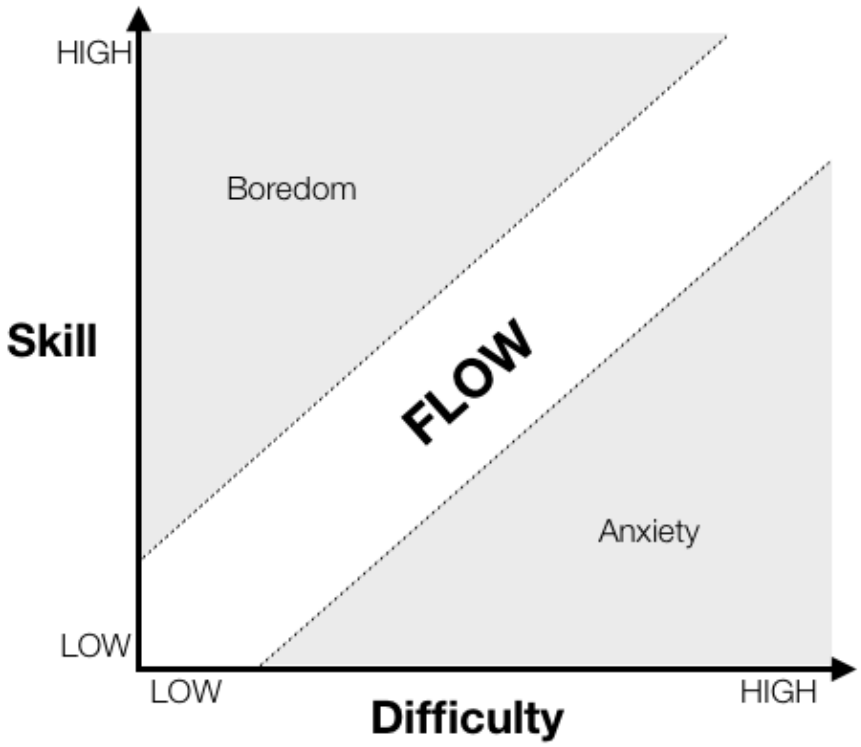

Image 2.9. Flow theory chart (Csikszentmihalyi in Baron, 2012)

2.6. Video Game Genres

According to the *Oxford Advanced Learner Dictionary* (2015), genre is defined as "a style or category of art, music, or literature". Genre in video games can refer to the style of play in the game's design, or the style of the game's narrative, if there's any to speak of. Examples of genre based on style of play are action, adventure, and survival, while genre based on narrative includes examples such as fantasy, science fiction, and horror; similar to genre in other media such as film and animation.

Genre in video games, just like in most forms of art, isn't a clearly defined concept – each individual genre such as 'action' can function as guidance for identifying a game's defining features in mechanics and narration, genres can also

restrain the design of the game, pushing it towards the more typical game elements that the genres represent (Fullerton, 2008). A game can be designed with more than one genre in it's design – for example, *Borderlands* (2015) includes many elements present in first person shooter games, such as a fast-paced gameplay, a player character viewed through first-person view, and major use of ranged weapons to deal with enemies. However, the game also includes role-playing game elements, with the player being able to upgrade the player character and unlock new abilities for the player character to use as they play.

2.6.1. Survival Video Games

While games in other genres such as action and adventure feature survival elements, as player characters dying inside the game often means loss, the survival game genre place even more incentive in, and build the entire gameplay design around staying alive. Because the main objective of the game is simply staying alive, based on James P. Carse's theory (1986), survival games are categorized as infinite games. In terms of players, survival games are usually single player, and in some games, players are allowed to cooperate with others.

In action games, players are required to be proactive in order to reach the game's objective. While staying alive keeps players in the game, simply staying alive without advancing through the game's obstacles proactively doesn't achieve the game's objective. In survival games, however, simply staying alive does fall in line with the game's objectives. Because of this, a survival game's mechanics are geared towards making sure that proactivity is needed for players to simply survive. In real game examples, this often comes in an in-game resource that decreases

steadily, and players must take action to collect, such as *Don't Starve!* (2013). More traditional game enemies that are defeated by combat often exist in survival games as well, relying on the player's need to find resources to stay alive in order to confront the player. However, unlike in games where the objective is to defeat enemies, the player character is weaker, and must spend resources to be able to fight enemies more efficiently, to make up for fighting not being mandatory.

2.6.1.1. Battle Royale Games

Battle royale games can be seen as a multiplayer competitive take of the traditional survival game genre. Battle royale games are session-based and typically done with large numbers of players per session, numbering at thirty, ninety, and possibly one hundred depending on the game. In battle royale games, each player also starts out with no equipment and resource, having to find and collect them in order to become more efficient.

There are two important distinctions in a battle royale game. Firstly, unlike the infinite format of survival games, battle royale games are finite games. The objective isn't simply to survive as long as possible, but given a clear end point – survive until the other player characters are dead. This makes combat and confrontation necessary in battle royale games. Another defining characteristic of battle royale games is a mechanic that narrows down the size of the map, therefore accelerating confrontation between players (Hornshaw, 2019).