

# Analysis on reward systems in video games: strategies in game design and their relation with addiction



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## Summary

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The number of concern parents who complain about their children's addiction to video games have exponentially increased. The word addiction is used today in different contexts, but when does this problem reach the medical concern? Several cases of video game addiction have been reported and, scientist have recently been highlighting the difference between playing too much and addiction. It is the engineers' duty to establish good design mechanisms that respect the limit of addiction.

This project seeks to give emphasis to the influence that video games have in society and to build the basis of studying how video games have an impact in human's psyche. It will be explained how the segregation of dopamine in the human body, can be linked to an addiction due to a primitive instinct of survival. Reward systems will be looked into detail, as the creation of dopamine is strongly affected by the feeling of reward.

The paper will analyse 4 representative video games in depth. These games are Candy Crush Saga, Genshin Impact, League of Legends and World of Warcraft. The principal rewards in these games will be analysed and a small survey will be conducted to the gamer community. It will be seen if the mind is really that influenceable and what are the rewards in video games that attract the players.



## Acknowledgements

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I would like to dedicate this project to my grandmother. The one who, despite not understanding a single thing about video games, always listens to me with a smile.

Thank you to my tutors, Carlos and Faraón, for their patience, advice and dedication. Without them, this project could not have been done.

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# 1. Introduction

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Nowadays, video games carry many stigmas around them. The word “addiction” comes to everyone’s minds when a person spends several hours in front of an electronic device. Society tends to forget how serious an addiction really is, and use the world freely in any context. There are serious reported cases of video game addiction and with each day passing by, scientists are starting to measure ways that video game addiction can affect the youngest generations.

One mechanism that can be seen in all forms of addiction is the feeling of reward. In the case of video games, it is the core system to the success of the game. Here is when the real question arises: “Are game developers and designers aware of the power they held in their hands?” At the present time, the mechanisms for creating video games are not regulated. The moral question begins to be raised as to whether this new technological works should be controlled in some way.

With the purpose of settle the dangers that this problem carries, this study is presented. Two main discussions will happen. First of all, the relation observed in the reward systems of the analysed video games and the link that this relation has with a tendency to addiction. Secondly, it will be reviewed the objectives proposed at the beginning of the study and see how they were correct in their approach. Once the conclusions of the analysis have been reached, they will be compared with the data collected from a public survey, to verify the raised premises.

The structure that this study will follow is divided into chapters, where the main parts of the information will be contained. The first chapter covers the Introduction, Objectives and Justification. The topic of the study will be presented, as well as the importance of the study and some objectives that will determine its success. The second chapter will cover the theoretic part. Here all the core terms discussed in the project will be explained, in order to set a defined framework where will later raise the analysis. Then, the third chapter will contain the analysis design, all the thoughts and deductions extracted

from the second chapter will define the analysis. In these parts will be also selected the video games that will be studied. Furthermore, the survey that will help later on to support the conclusion, will also be designed in this chapter. The fourth chapter will be the analysis of these games. Later on, the results of the analysis will be discussed in the fifth chapter. Finally, in the sixth chapter the conclusion of the study will arrive. This will include a compendium of the whole project and the review of the objectives. After the main chapters, it can be found the bibliography and webliography as well as the figure index and table index. A glossary with explained concepts regarding video games will also be included in this last part of the memory,

## 1.1 Justification and Objectives

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According to Tiryakioglu (2001), the Video Game Interaction Model (VGIM) uses the Gratification Models studied by psychology for many years to engage the user. “It is the player himself who selects, defines and interprets the content to his own gratification” (Izzat. K 2021). This means that no matter the game, or even the activity, humans tend to find a way of enjoying what they are interacting with.

There is no bigger feeling of gratification than the one experienced when humans are given a reward, due to the release of hormonal substances in the body. One of the main mechanics studied and applied in game design are Reward System. There is a problematic then, on to what extend are Gratification Models exploited when it comes to creating video games. A consistent repetition of this pattern is dangerous, as it can lead to addiction.

But not only video games carry with them the stigma of addiction. Many others aspects of video games are raising concerns among psychologists. Violent games do lead to aggressive language and behaviours (Irwin and Gross 1995). There is also concerns with “problematic of the portrayal”, video games are strong educational assets and sometime can mislead users by the representation of an altered reality. Not to mention the

huge impact of video games technical properties in objective users that experience mental disorders.

It has also been proved that the many benefits of video games help the youngest with several points of their development: from cognitive aspects to theoretical ones. They can improve the brain's capacity of response. When used in a proper way, they create an environment for cooperation, where leaderships abilities and strategy creation abilities appear.

If one thing is clear, it is that video games harbour a much greater psychological importance that what is now being recognised and this must be studied in order to guarantee the wellbeing of human's minds. The decisions made in the Game Design and User Experience creative process matter. It is necessary to question the intentionality of developers when they apply "addictive" characteristics to take advantage of an economic design pattern. To choose what is known to work and please users in order to take advantage, instead of creating video games for the sake of the creativity.

Currently, the offer of video games is extremely wide and grows every day. None can deny that the video game industry is captivating the users and expanding into every sector of the economy. Video games are nowadays easily created thanks to the development of the technology, making the possibilities endlessly. Not all video games are similar, some run only into a specific device, some are more aesthetical pleasant than others and some do not have a purpose and exist with the mere purpose of entertainment while others have a clear goal. But yet, one thing remains in all of them: the gratification that the players earn when completing a task. Or what is the same, the user will always obtain a reward in a video game.

It is important to pinpoint that the work of engineers is not only limited to the developing area. As the people responsible for the creation of new technologies, we have an obligation to society to guarantee that these technologies will be ethical and will not present any moral dilemma. That is why studies like this one are so important, to ensure

the creation of video games respects the human values and to highlight wrong working methods and behaviours among the video game creation community.

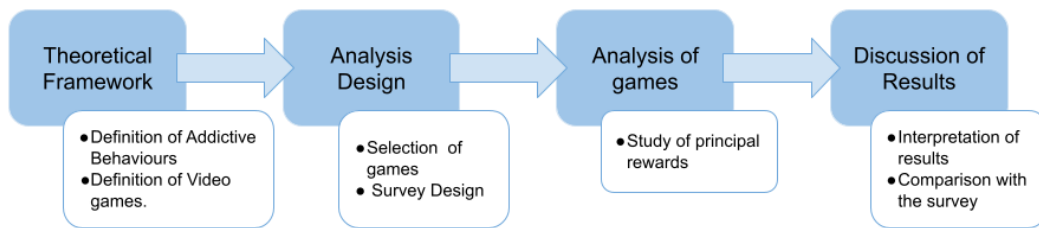
The general objective of this study is to put into value the power of reward systems in video games, as a potential source of video game addiction. Therefore, this objective shall be broken down into smaller ones, that will lead the way to draw a general inference:

- Short exploration on the theoretical concepts needed to understand the mentioned topics.
- Construct an analysis that can be applied to the general basics of all video games.
- Determine the technical aspects of reward systems that have the strongest impact.
- Study principal reward systems of 4 video games that have a strong impact in the actual society.
- Compare the results of the analysis: Draw common points on reward systems from different video games and see how they influence players.
- Conduct a Survey: To equalize the conclusions of the analysis with the population.
- Propose future applications and alternative ways of continuing the study.
- Clarify misconception about video games.

## 1.2 Methodology

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The methodology followed by this study is the same as in any case study. There are four main parts differentiated: Theoretical Framework, Analysis Design, Analysis and the Discussion of the results. It can be better observed in Figure 1.



**Figure 1. Methodology phases**

In the Theoretical Framework, all the terms included in the study will be explained. This will help to understand how addiction is caused, not only in a psychological way, but also the neurologic reaction that causes in the brain. It will be also seen the state of recognition that video game addiction has by the scientist, to clarify the importance of the issue. Finally, some topics regarding the technical aspect of video games will be defined.

When it comes to building up the Analysis Design, all the concepts viewed in the Theoretical Framework will be applied to select the characteristics of rewards in game that will be looked in to study. All the data that will be looked into, will help us to easily compare it between the games. In the Analysis Design it will also be where the games that will be reviewed are chosen. This selection of games will represent popular games that have an impact in the society in this moment. Moreover, the survey that will be commented in the final discussion will be also designed in this part.

Meanwhile, in the Analysis, the main Reward System of each game will be studied. This study will follow the topics proposed in the Design in a tabular form.

Finally, the results will be discussed. First an initial conclusion for each game will be reached. After that, the common points of these deductions will be compared with each other, in order to draw general findings applicable to all video games. Once these findings have been settled, they will be compared with the results of a small survey.





## 2. Theoretical framework

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In order to start with the analysis, some aspects need to be clarified beforehand, so the elements that are mentioned throughout the study are correctly defined. With this introduction, all the principal topics of the analysis will be covered.

First of all, it will be explained the correct meaning of addiction, not only on a psychological level but also in the neurological implication it has on our bodies. The principal element in charge of this reaction is dopamine, so it will also be introduced in the theoretical framework, to understand how it is produced and its relation to addiction.

Secondly, the gaming disorder as an addictive behaviour will be presented. The insights of the issue from a social viewpoint will be understood. As this is an issue that has quickly escalated and it is being recognised by the experts.

Subsequently to that, it will be defined the concept of videogames and a classification of them will be examined. This part is crucial, as it will determine the structure of the further down analysis.

The theoretical framework will conclude with the introduction of the reward system, and how it is conceived in the neurological field and in video games.

### 2.1 Addiction and dopamine

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Over the years, addiction is a term that has been devalued, to the point where it is used in colloquial language. It is commonly heard: “I am addicted to this” when a person wants to express that he or she enjoys something. However, the word addiction implies a much more deep and severe meaning.

Addiction is a chronic medical disorder, as so stated by the American Psychological Association (APA). For the APA, addiction is known as “a chronic disorder with biological, psychological, social and environmental factors influencing its development and maintenance”, referring to either substances or behaviours. What leads to the uncontrollable desire to repeat the activity is the feeling of Reward.

In theory, you could be addicted to anything, but is not as simple. There needs to be an antecedent so that an addiction can be developed. One of the antecedents is genetic. There are studies that demonstrate that the degree of reward for consuming a certain substance or engaging in a certain behaviour, may change due to genes. A study published in PNAS (2018), the official journal of the National Academy of Science, proved that. This study found in multiple people with substance use disorders (such as drug addiction) the HERV-K HML-2 (HK2) retrovirus, an alteration of RNA. This genetic malfunction is related to the administration of dopamine.

The key to the addictive feeling is dopamine. Our brain releases dopamine when something is addictive from an evolutive point of view. This discharge of hormones in our nervous system translates into motivation, the mindset changes from the “*desire*” circuit to action. When people listen to their instincts and follow the dopamine’s will, their bodies will remember this action. For example, imagine hiking in a forest, and suddenly finding a water source from which that you can drink. Next time you do the same hike, you will start becoming vigilant and enthusiastic when you approach the water source.

In short, dopamine is “the fictitious hormone”. It runs away from the real and present possibilities and seeks the future imaginary ones. Only when the reward is immediate, gets the stimulus released. The problem appears when it is constantly sought to feel this anticipative feeling. A substance or behaviour is not addictive by itself, the person becomes addicted to feeling dopamine in the nervous system. That is why all types of addictions have similar patterns in behaviour, diagnosis and treatment. The subject tries to avoid the lack of dopamine in the organism at all costs: first trying to reach the “*desire*” circuit at any time possible, secondly stopping the decrease of dopamine in the organism and finally reinforcing the levels of constant dopamine in the present moment.

Following these steps is what makes the addiction to be born. You can end up addicted to something that you do not even like. Your brain can tell you that you want something due to dopamine, even when you do not actually enjoy it.

With this, it has been defined that addiction is not only a mental disorder but also a neurological issue and how it can be triggered.

## 2.2 Addictive Behaviours, Video game addiction

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Now that it has been explained what an addiction is and why it is caused, the analysis of video game addiction can start. As it has previously been mentioned, addiction may be developed towards a substance or a behaviour, it is in this second category where video games are catalogued. An addictive behaviour is an activity that is both rewarding and reinforcing in form of a stimulus.

The World Health Organisation (WHO) recognised in 2018 the Gaming disorder and included it in the 2018 International Classification of Disorders (ICD). It was added along to Gambling into possible Addictive Behaviours. This fact is of course alarming and should be a warning to society, but it does not implicate that all the people who play video games for a considerable number of hours suffer from this disorder.

For the WHO, gaming disorder is “a pattern of gaming behaviour, characterized by impaired control over gaming, to the extent that it takes precedence over other interests and daily activities, despite the occurrence of negative consequences”. To summarise, when gaming takes control over someone's life and endangers the correct way of living and socializing.

The decision to add this behaviour into the ICD was due to the result of the study on game addiction. There were clear shreds of evidence of gaming addiction in different regions of the planet. A consensus made by a different specialist was made, and the necessity to include it in the ICD in order to provide treatment guides was stated. The

WHO indicates that as a warning sign, it should be considered the time a person spends playing video games. It will be concerning when playing video games jeopardizes the physical and psychological health of an individual. There has even been developed an actual scientific way to calculate video game addiction, the video game addiction scale for adolescents (GAS, 2022).

Now that it has been stated the issue of Gaming Disorder, can also be explained as the relationship it has with dopamine and addiction. Video Games themselves are strong dopamine releasers, as they follow the mechanism of slots machines. Despite each game having its own goal, most of them (if not all of them) focus on unpredictable rewards. This will be explained later on, but the uncertainty of when will the players receive the reward they are waiting for, creates a lot of dopamine. This series of characteristics that developers include can be categorised as “addictive”, as even in ignorance of the cause, they are implementing features that make players release dopamine.

Video games are based on exploring and progressing, this scenario creates a permanent state of uncertainty, or in other words: a constant generation of dopamine. There are always new things to obtain or investigate, in most of the games the possibilities are endless, thus creating the perfect dopaminergic dream.

Blaming developers may not be the answer to why this is happening. Most of them don't have the psychological information explained in this framework. They simply ask themselves: “What will the player like the most? What works?”. Popular online games even record thousands of data from players, in order to change aspects of the game so the player will enjoy it even more. This is what makes a video game successful but also can make it prone to generating addiction.

## 2.3 Videogames and classification

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Video Games are as electronic games, where images are displayed on a screen and there is an input of some sort from the player (Hall, S 2020). Within this era's technology, there is a varied layout of consoles where video games can be played. The only limit is hardware, but even on mobile phones, extremely complex and expensive in terms of performance video games can run.

Most companies are pledging to multiplatform, this way they can expand their profits and reach more users, in exchange for a small price. Adapting games to other platforms is pretty easy, even nowadays computer games can be seen in mobile adaptations.

Having this in consideration, it is not accurate to classify games according to the platform. For that the following classification is presented, analogous to the way of playing-related to the gaming community, as most significant differences are found this way. Each of these types of video games presents its own characteristics and own incentives to attract the player.

### 2.3.1 Single-player games

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Single-player games are those where, through the game, only the input of one player is embedded. This doesn't exclude internet connection, as lots of assets, post-game content (such as DLC) and information can be downloaded into the game after purchasing it. This type of game doesn't accentuate competitiveness inside the game environment as the other types, but comparisons may still be made. The feeling of community is usually achieved through social media and here is where competitiveness may rise. Single-player games create a very intimate connection between the player and the rewarding feeling, as external elements do not interfere. A division can be made, in relation to rewards, with the amount of time applied to obtaining them. More complex video games, usually seen on consoles, require a greater number of hours and skill to get a reward. This makes the

discharge of dopamine last longer. You are anticipating for a long time the reward you want to obtain, for example, defeating a complicated boss. Along all of the attempts and battles, the body will be producing dopamine. On the other hand, it can be seen fast and easy rewards, such as in mobile games. The main difference is that dopamine will be produced in short periods of time and more quickly.

### 2.3.2 Multiplayer games

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Multiplayer games are those that allow input from two or more players. The input can be obtained either in physical ways or online, what is known in video games as Local mode or Multiplayer mode. The progression of Multiplayer games has escalated in these last years, thanks to the development of new technologies and the internet. Now the input of the player online can be as fast as the local one, this phenomenon has increased the number of Multiplayer games that make it possible to experience exchanges between users in real-time. The most popular genre of videogames that explodes this feature to the limit is called MOBA (*Multiplayer Online Battle Arena*). In this genre, the game follows the same structure as card games. Two teams or individuals compete against each other, in a relatively small period of time (from 3 minutes as in Clash Royal to 1-hour league of legends). MOBA promotes competitiveness, as the principal source of dopamine. In one game there will only be two options, win or lose. The Rewarding feeling will be obtained from the ranking position in the community of the game, and the possibility to unlock exclusive features with these victories. Inside the game, there can be other features that promote engagement, as will be explained later on.

### 2.3.3 MMO

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Previously, Multiplayer games have been defined. MMO (*Massive Multiplayer Online*) are a derivative of Multiplayer Games, with the particularity that all of the players are connected at the same time and interact with others constantly. One of the peculiarities of MMOs is that almost all of them are free, unlike multiplayer and single-player games. This strategy attracts lots of new players, and income from the game will arrive from the

inside store, as most MMOs are “Pay to Win” (P2W). The player will only be able to advance quickly if he/she spends money, otherwise with the natural path to progress implemented in the game, lots of hours will be required. The constant comparison with other players more advanced from the same lobby will urge the player to choose one of the two mentioned scenarios.

These games collide more with the psychological needs of the player. In single-player games, it was observed how a connection with the general reward system was established. But in MMOs, the social needs of the player may be satisfied. Not only the urge for dopamine will be solved, but the need for social interaction will be solved too. In these games, the factor of interaction with the community is essential, sometimes even compulsory to advance. The player can develop meaningful connections with other players. They may experience a strong feeling of belonging and growth with the community, as they advance in the game together and rise in positions as a pack. This has made MMOs the type of game with more Game Disorder cases and can be considered the most dangerous one in this aspect.

#### 2.3.3.1 MMORPG

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Inside MMOs, there is a genre called MMORPG (*Massively Multiplayer Online Role-Playing Game*) and it appears when an MMO has role components featured. As communication is a fundamental key in the MMOs, almost all of them are considered to be RPGs. When a player interacts in the game, he/she is representing a character and depending on the one, various attributes and abilities will be increased. Some MMOs that did not have an RPG Component designed by developers have ended up being considered MMORPGs. Such is the case of *GTA V*, where the community of players itself has created the role-playing mode.

## 2.4 Reward System in Video Games

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The Reward System, also known as the Variable Rewards System, includes all the mechanisms that will, in exchange for something, give the player an item or experience with the same in-game value. A reward can be as simple as an upgrade or a restriction without which the game experience is limited. An item that makes us advance in the game progression, a key that unlocks part of the games, armours, weapons and other concepts are examples of rewards.

“Reward mechanisms provide sense of fun by fostering intrinsically rewarding experiences and are equally or more important than the extrinsic rewards that are distributed.” (Wang & Sun, 2012). In this definition the term “intrinsic” relates to the experience of fun itself, whereas “extrinsic” is used to refer to the actual reward in the game. As it happens with addictions, player sometimes do not actually enjoy playing, but still push through it in order to obtain the extrinsic reward they want. It is the same thing that happens with the dopamine hooking through repetition of certain behaviours.

The psychologist B.F Skinner discovered that rewarding animals for performing certain actions will lead them to repeat these actions constantly. It was Robert Sapolsky who related this phenomenon with dopamine: the expectation of receiving the reward will make the user to engage to this action. It can be concluded that from all the features a game can have to attract consumers, the reward system is the most related one to addiction, as it has a direct impact on the dopamine flow of the human body.

It was in the study proposed by Wang & Sun (2012), where a classification of rewards was made. The study suggests to list rewards based on the form they are presented in the game and the way that player use this reward. Based on the form it is found:

1. **Score systems:** classification based on number or positions that marks the player performance. It is one of the first forms of reward and was investigated



by many researches. In 1981 Malone dictated that was crucial to have fun in a game.

2. **“Level up”**: In games where the player controls an avatar with developable characteristics there is an experience system. The user will gain rewards in form of experience points, that will allow the avatar to obtain new skills or what is the same, more power. The level of the avatar limits the experience of the player, as the difficulty rises along the game, the avatar will need more level to advance without difficulty. It has a strong feeling of progress and achievement attached to it.
3. **Item granting**: This strategy maintains the attention of player in between plot-advancing events. It also encourages world exploration and they are considered items of renown inside the game community.
4. **Resource gathering**: Some games have the mechanic of crafting. The player can build their own items with the resources they collect throughout the game.
5. **Collecting Achievements**: As a challenge to the players, video games offer titles to glorify them. In order to obtain these titles, the player must go beyond the main line of the game, complete special quests or play in a specific way.
6. **Feedback messages**: Is the most immediate form of reward. They cannot be used as an achievement tracer, as it has no value or affects any score. Usually they are noticeable in sound effects, pictures and words. They aim to create a positive emotion, not to arise comparison between players.
7. **Animations and pictures**: They appear after major events take place. Their goal is to urge players into completing the game storyline. Players enjoy them as they are aesthetically pleasing and mark their progression.

8. **Unlocking mechanisms:** Allow the player to unblock more game content when a special requirement is fulfilled.

The second classification formalises the way that players use the rewards. In the Figure n°1, Wang & Sung (2012) proposed a dual-axis classification. One axis represents the sense of community and the other one the importance of the reward to progress in the game. Looking at it like this, four classification are presented: Review, Advancement, Cooperate/Compete and Sociality.

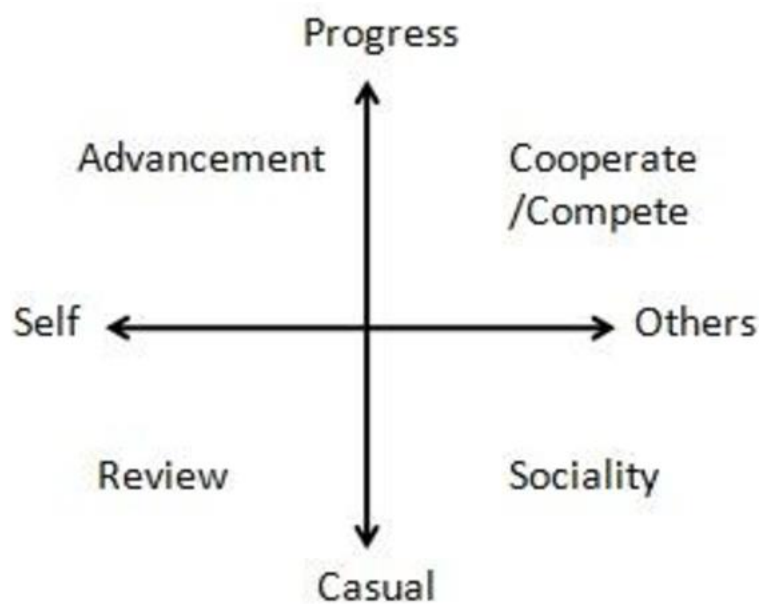


Figure 2. Reward usage classification (Wang & Sung, 2012)

Rewards in single-player games will only be the ones in the “Self” section. “Advancement” for crucial game rewards and “Review” for entertainment rewards. For multiplayer game, the options will be “Cooperate” (playing with users) and “Compete” (playing against users) in important rewards and “Sociality” in the entertainment rewards. Meaning for multiplayer games the “Others” section will be followed.

### 3. Analysis Design

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Looking at the APA definition of addiction, the causes are 50% genetic and 50% influenced by the setting. This second condition is the one that will be analysed in this study. It will be looked into if the methods used to make rewards systems abuse the tendency that humans have for addiction.

After contextualizing the terms and definitions that will be mentioned and on which the analysis will be based, the main topics of the analysis can be constructed. The goal of the analysis is to articulate a structure, that can determine if video games misuse the psychological knowledge that exists nowadays regarding dependency and liking.

To conduct the analysis, the main rewards systems of some games will be looked into detail. Several characteristics will be studied from these rewards, in order to later be able to establish differences and similitudes. It will be used the classification proposed by a study in the University of Taiwan and aspects that help contextualize the difficulty and nature of obtaining it. For each reward, it will be analysed:

**Form of Reward:** As it was defined in the theoretical framework, the classification proposed by Wang & Sun (2012).

**Actions:** An action or several actions can generate one or multiple rewards. Observing the actions required to obtain a reward, will allow us to rank it into difficulty levels. It could be later seen on the survey which rewards users prefer, difficult ones or easy ones. Normally, the difficulty of the action needed grows as the price rewarded is more valuable.

**Quantity of Rewards:** Number of items or experience that the player is rewarded with each time.

**Probability of the rewards:** Study how likeable is that reward to be obtained.

**Time limit:** Some games will deliver a reward by default or only allow the player to perform a certain action when a certain time has elapsed. This characteristic will also determine the way of releasing dopamine through time by the user in-game. In the survey, it will be shown which time limitations incite more to play.

**Events:** Study how many Event Reward the game offers and the frequency of them. This characteristic is really important in inciting the users. The items offered in these events are usually exclusive and can only be obtained at a specific time. With games that depend on the internet, it will be impossible to obtain mentioned items after the event has expired.

**Payments:** If the reward can be more easily obtained by paying real money in the game or if it is strictly limited by money.

**Connection to the Internet:** check if it is necessary for obtaining the reward to be connected to the internet.

**Use of the Players:** Dual-Axis proposed by Wang & Sung (2012).

With all of these characteristics set, numerous conclusions can be made. All the information for each reward will be structured inside a table such as seen in Table 1.

**Table 1. Example of the Analysis table**

<b>Reward</b>	<b>Assessment</b>
<b>Form</b>	Description
<b>Action</b>	Description
<b>Quantity</b>	Description
<b>Probability</b>	Description
<b>Time limitation</b>	Yes/No
<b>Events</b>	Yes/No
<b>Payment</b>	Yes/No
<b>Internet</b>	Yes/No
<b>Use of the player</b>	Description

### 3.1 Selection of games

---

In order to get a consistent conclusion with the analysis that will be conducted, some sample games will be chosen. These games represent a category from the video game classification made in the previous section. For single-player video games, two games will be selected, as two ways of realising dopamine were differentiated. Having this selection will allow the development of the findings from the analysis more deeply, as a pattern between all types of games may be observed.

The criteria to choose each game will be now looked into in detail, but the main objective is to select video games played by a large number of users. With more players, more possibilities exist to develop addictions. Most of these selected games are known specifically for the number of time that people spent playing them. The analysis and description of the games will be made further on, in this section the focus will be on the number of players.

In single-player games, two classifications have been made. The difference between them is the way of realising dopamine through time. One category with quick rewards and frenetic rhythm and the other with more hard-achieving rewards where time and skill are required.



Figure 3. Candy Crush Saga header. Source: King

The first game that will be selected is *Candy Crush*. This game fits the first category of fast rewards. Another characteristic that is worth noting is that it is a mobile game. Mobile games hold lots of influence in society, as they are accessible to almost everyone. What is most surprising is that *Candy Crush* appeals to a wider age group, as Newzoo Consumer Insights (company specialised in Games and Esports) states that 40% of players are above 35 years old. It is interesting to analyse such a game because the results will represent a diverse demographic group. Video games are not only a thing for young people and teenagers, in fact mobiles close this generational gap more each year.

In relation to the number of players, according to Business of Apps (technology web magazine), over 250 million users play *Candy Crush* once a month. King and Activision Blizzard estimated the profit of this game in 2020 to be \$875 million and to have 273 million users. Despite having its peak of downloads in 2015 (King, 2020) with 327 million registered users, the data reflects that it is still a renowned mobile game.



**Figure 4. Genshin Impact header. Source: PlayStation**

To represent the second category of single-player videogames, *Genshin Impact* is the chosen game. This game was released in 2020 and although it is the newest one in the selection, it has already drawn the attention of lots of players. This shows that even a new game can quickly engage with the gamer community if it is attractive enough. Another reason to have picked this game is for the main system of rewards known as Gacha. This key game element has been reported to lead to addiction, as so confirms a study (Farina. I, Fitriana. M & Chuin.C.L, 2021) included in the 1st Borneo Psychology Seminar 2021 made by the University of Malaya-Wales. It is worth noting that Gacha games tend to create more addiction than others that do not have this mechanic.

Active.player.io (2022) estimates that approximately 9 million users are active each day in *Genshin Impact* in 2022. This number represents only 15% of registered users since it launched in 2020. In relation to players in a month, the amount is about 50 million on a normal basis.





Figure 5. League of Legends header. Source: Epic Games

For the multiplayer game, the game selected is *League of Legends (LOL)*. What outstands from this game in addition to the number of players, is the huge entertainment community that it has developed. The company has created its own universe, that expands through comics, narrative, merchandising, other video games of the franchise and the latest incorporation, a Netflix show called *Arcane*. LOL has also a wide number of followers engaged in the professional competition scene, even when some are not players themselves. It is similar to the fanaticism that surrounds football. This sets an ideal scenario and environment for addiction to be developed, as the feeling of community is huge.

As for the numbers, currently in 2022 League of Legends has an average of 127 million players per month. Around 1 million estimated active users are connected every second to the game (ActivePlayer.io, 2022). A recent study made by the UK retailer Game, states that LOL was viewed on the streaming platform Twitch for a total of 712 million hours between 2019 and 2020, making it the second most viewed.





**Figure 6. World of Warcraft (DragonFlight) header. Source: Blizzard Entertainment**

Finally, World of Warcraft is the game chosen to represent MMORPG. This game is widely known by the community and has a bad stigma surrounding it in relation to addiction. Lots of studies have been already made and shocking news have flooded newspapers about how extreme addictions cases came out. What is most surprising is that World of Warcraft was released in 2004 and it keeps having a solid player base. In an RPG it is crucial the addition of new content, new narratives and new missions, so the player has every moment something new to accomplish. The users need to have constant sources of dopamine to satisfy their needs as they advance in the game. The work that developers have made and still do in the rewards system is remarkable and will be seen later on.

Right now, in 2022 World of Warcraft has a media of 5.5 million players per month and was declared in 2009 the most popular MMORPG with 10 million users, which at that time was an outstanding number. Game has stated that World of Warcraft is the second most played game in history, with 2.08 billion days played.

As Table 2 represent, all these games are having an impact in society in this moment, considering the large number of actual players. This will anchor the results of the analysis.

Table 2. Comparison of users

Games	Users per month (March 2022)
<b>Candy Crush Saga</b>	250 million
<b>Genshin Impact</b>	50 million
<b>League of Legends</b>	127 million
<b>World of Warcraft</b>	5.5 million

### 3.2 Survey Design

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As mentioned before, this analysis will include a small survey. The intention of this survey is not to deeply analyse the opinions of the population, but to contrast the results obtained in the video games study.

The survey will be designed with the tool that provides google with their accounts called “Google Forms”. Therefore, the survey will be an online form. The question will be straight forward. Each game will be represented by two questions. First respondents will be asked if they have played the video games. Then, they will be asked which rewards they enjoy the most (a list with the analysed rewards in the next chapter will be displayed on the screen). The conclusion of the analysis will try to calculate which rewards have a bigger effect on the player, so asking participants which rewards they prefer will reveal interesting information. The survey is intended for the gaming community, as specific questions about the video games will be asked. It is intriguing to see from between the games which one is more played, but respondents must at least be regular video game player. With the scope that the selected video games cover, there will not be a problem with people knowing these video games. Lastly, the survey will circulate by social media networks as WhatsApp and Instagram.

Respondents were sent this [link](#) to complete the survey. The survey was closed once the results were collected in order to draw the pertinent conclusions. Right now, the survey is open so anyone that access the link can check how the questions were presented

to the respondents. In Figure 7 and Figure 8, it can be seen how the survey was distributed in social media. In WhatsApp, all users interested could access the form via the given link. In Instagram users had to access the link once they viewed the story and clicked on it.

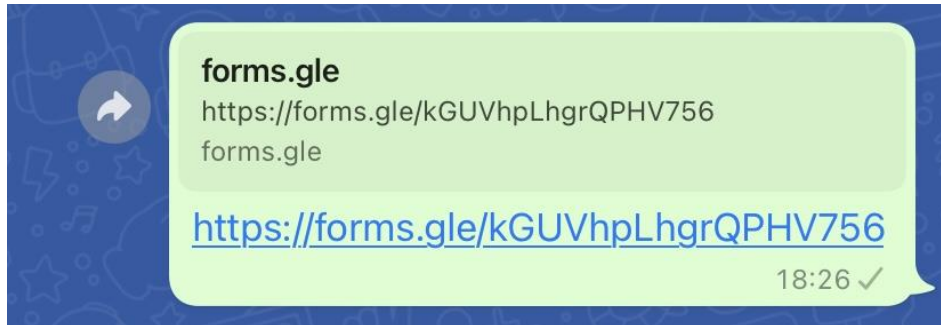


Figure 7. Distribution of the survey via WhatsApp. Source: WhatsApp's screenshot.



Figure 8. Distribution of the survey via WhatsApp. Source: Instagram stories.



## 4. Analysis

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Bearing in mind the parameters defined in the Analysis Design, the main Reward System of each game will be examined. It is important to clarify that for games as *Candy Crush Saga* and *League of Legends*, the rewards analysed will be the ones after completing a level (in case of Candy Crush) or game (in case League of Legends). The reason is that these are the main actions that trigger the main reward system of the game. The rewards obtained in these states of in-game only last until the match/level is over. They do not endure over time.

### 4.1 Candy Crush Saga

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Figure 9. Candy Crush welcome page. Source: Candy Crush Saga

Candy Crush Saga (2012), most known as Candy Crush, is a mobile game released in April of 2012 by King. It was originally developed for Facebook, but was adapted to mobile devices in November of the same year. Due to the exit of the company and the successful launch of two sequels (Candy Crush Soda Saga in 2014 and Candy Crush Jelly Saga in 2015), King was acquired in February 2016 by Activision Blizzard for \$5.9 billion.



The game follows a pretty easy mechanic, the “match three”. This mechanic by itself makes a whole game genre, Tile-matching video games. The game features different candies in a board, the player will have to swap them so at least three of them match in a row. Once the matching candies have disappeared, more will come in to fill their gap. Combining candies will earn the player points, and the movements of candies will be restricted each level to a specific amount. The game is strictly linear, meaning that the player will only be able to play the level he/she is at and previous completed ones. The player has up to 6 lives, that are accumulative. If the player has no lives left, he/she will have to wait until at least one is recharged to play again.



Figure 10. Candy Crush in-game. Source: Candy Crush Saga

The currency in Candy Crush Saga are gold bars. With gold bars the player can purchase different boosters and packs of boosters, but the most interesting use recommended by players is purchasing extra lives. Gold bars can be purchased in the store inside the game or be acquired for free in a very limited number of events.



Figure 11. Candy Crush Saga store. Source: Candy Crush Saga

#### 4.1.1 Completing a Level

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In Candy Crush the main trigger of rewards happens when the player passes a level. Now this will be looked more into detail. Every time a player completes a level, a dialog screen will pop up indicating the level has been completed. When this happens, the player receives always the following rewards:

- A score for that level is calculated:

**Table 3. Star Score and points in Candy Crush**

<b>Star Score and points</b>	<b>Assessment</b>
<b>Form</b>	Score System
<b>Action</b>	Pass a Level
<b>Quantity</b>	From 1 to 3 stars, 1 score is calculated each time a level is passed.
<b>Probability</b>	-
<b>Time limitation</b>	No
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	No
<b>Use of the player</b>	Review, as score does not limit the progress in the game.

- The player unlocks a new level:

**Table 4. Unlocking a new level in Candy Crush.**

<b>Unlocking new level</b>	<b>Assessment</b>
<b>Form</b>	Unlocking Mechanism
<b>Action</b>	Pass a level
<b>Quantity</b>	1 level is unlocked
<b>Probability</b>	-
<b>Time limitation</b>	No
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	No
<b>Use of the player</b>	Advancement



- The screen shows a new interface and plays sound effects:

Table 5. Pop ups when completing a level in Candy Crush.

Pop up screen and music	Assessment
Form	Feedback Message
Action	Pass a level
Quantity	1
Probability	-
Time limitation	No
Events	No
Payment	No
Internet	No
Use of the player	Review

If the player has finished a chapter (a collection of levels), a short animation of the characters will be displayed. See Table 6.

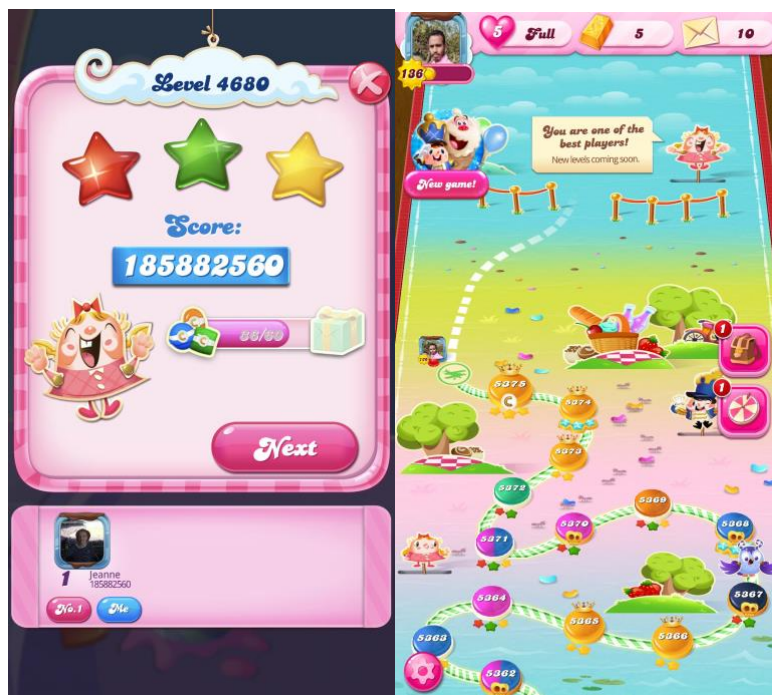


Figure 12. Level score and level map. Source: King Community

Table 6. Story progression in Candy Crush.

Story progression	Assessment
<b>Form</b>	Animation
<b>Action</b>	When a level is passed and the chapter is completed
<b>Quantity</b>	1
<b>Probability</b>	1/15
<b>Time limitation</b>	No
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	No
<b>Use of the player</b>	Review

#### 4.1.2 Daily Boosters

Everyday a player logs in the Candy Crush Saga app, a daily booster wheel will pop on the screen. This roulette will give the player each day a random reward, as the player presses the “Stop Wheel” Button and it stops slowly. The prices of the wheel are boosters that can be used while playing the levels. Among all the possible rewards, the best one is the jackpot, a collection of all the rewards available in the wheel.



Figure 13. Daily Booster Wheel. Source: Candy Crush Saga

**Table 7. Daily Booster Wheel reward.**

<b>Daily Booster Wheel</b>	<b>Assessment</b>
<b>Form</b>	Item Granting
<b>Action</b>	Logging in
<b>Quantity</b>	1 booster
<b>Probability</b>	Jackpot: 1/450
<b>Time limitation</b>	Yes, once a day
<b>Events</b>	No
<b>Payment</b>	Yes, second wheel up to 500 gold bars
<b>Internet</b>	No
<b>Use of the player</b>	Advancement

### 4.1.3 Life System

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When the player loses a level, either because there are no movements left or because the time was up (a small amount of levels has time limitation), he/she will lose a live. Once the player has lost a life, a countdown will be activated, indicating the time that must pass until that live is recovered. Without lives the player cannot continue to play, making lives the most valuable resource and therefore, reward. See Table 8.

### 4.1.4 Events

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Now it will be explained the main events that Candy Crush launches. Two main events can be differentiated: sponsors ones and Candy Crush Saga ones. All the rewards from these events are boosters (in-game boosters or infinite lives boosters). Events need internet connection as they are triggered for all users at the same time. In case of sponsor events the players will need to download new data.

Table 8. Life recharge in Candy Crush

Live recharge	Assessment
<b>Form</b>	Item Granting
<b>Action</b>	Losing a live
<b>Quantity</b>	Maximum of 6
<b>Probability</b>	-
<b>Time limitation</b>	30 minutes each live. 2h and a half for all the lives to be restored
<b>Events</b>	No
<b>Payment</b>	12 gold bars
<b>Internet</b>	No
<b>Use of the player</b>	Advancement

The last main sponsor event was featuring Sonic the Hedgehog, for its new film Sonic2 (2022). This event challenged the users into combining blue candies while playing, Table 9. The blue candies were changed into a spinning wheel that resembled Sonic. Furthermore, all the players who completed this event received a badge, as Table 10 represents.



Figure 14. Welcome page in Sonic event. Source: Candy Crush Saga

Table 9. Sonic events items

Boosters/Life from Sonic event	Assessment
<b>Form</b>	Item Granting
<b>Action</b>	Collecting 12000 Blue candies
<b>Quantity</b>	3 Jackpots
<b>Probability</b>	-
<b>Time limitation</b>	31 March – 3 April
<b>Events</b>	Yes
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Review

Table 10. Sonic badge.

Sonic Badge	Assessment
<b>Form</b>	Collecting Achievements
<b>Action</b>	Collecting Blue candies
<b>Quantity</b>	1
<b>Probability</b>	-
<b>Time limitation</b>	31 March – 3 April
<b>Events</b>	Yes
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Review

An example of a Candy Crush Saga event is “Treasure Ahead”. The player will see in the level selection view, three treasure chests ahead. All of these chests will grant the player a variation of boost.

**Table 11. Treasure Ahead reward.**

<b>Treasure Ahead</b>	<b>Assessment</b>
<b>Form</b>	Item granting
<b>Action</b>	Passing 1, 3 and 8 levels
<b>Quantity</b>	First chest: 2 booster and 1 live boost Second chest: 3 booster and 1 live boost Third chest: 4 boosters and 1 live boost
<b>Probability</b>	-
<b>Time limitation</b>	48 hours
<b>Events</b>	Yes
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Review



**Figure 15. Treasure Ahead view. Source: Candy Crush Saga**

#### 4.1.5 User's Challenges

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Finally, it is presented the last main type of reward in the game. Even though Candy Crush Saga is a single-player game, it promotes competitiveness within the community inside the game. Through two competitions, the game connects the player and rewards them with boosters according to their merits.

The Weekly Challenge competition rewards the top 3 players from an assigned group that more levels have pass.

**Table 12. Weekly Challenge reward.**

<b>Weekly Challenge</b>	<b>Assessment</b>
<b>Form</b>	Item granting
<b>Action</b>	Passing more levels than the group
<b>Quantity</b>	Jackpot
<b>Probability</b>	-
<b>Time limitation</b>	1 week
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Review

The second is called “Fast Race”. When a player reaches a starting of chapter level, he/she will be paired up with more players that are on the same level. The ones who advance more quickly, meaning they pass more levels than the rest, will receive the rewards. This is the only candy crush regular event that grants gold bars.

**Table 13. Fast race reward**

<b>Fast race</b>	<b>Assessment</b>
<b>Form</b>	Item granting
<b>Action</b>	Placing in the top 5
<b>Quantity</b>	1 <sup>st</sup> place: 15 gold bars (accumulative until 40 gold bars) 2 <sup>nd</sup> place: 8 gold bars 3 <sup>rd</sup> place: 5 gold bars 4 <sup>th</sup> place: 3 gold bars 5 <sup>th</sup> place: 2 gold bars
<b>Probability</b>	-
<b>Time limitation</b>	Winning before top 5 has been completed
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Review

## 4.2 Genshin Impact

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*Genshin Impact* is an action role-playing video game (ARPG) launched on September 2020 by HoYoverse (known as HoYo), a Chinese video game development studio based in Shanghai. The main features of this video game are its open world and that is free-to-play. What it is interesting and worth studying is the Gacha Mechanic, the key factor to the game's success in such a short notice. It was released in mobile devices as well as in PC, PlayStation 4 and PlayStation 5. It currently developing its launch for Nintendo Switch.





**Figure 16. HoYoverse Logo. Source: HoYoverse**

The game follows the story of two brothers, Aether and Lumine (masculine and feminine options for the main chapter). The brothers are cursed by a goddess and separated from each other, the player must explore the continent of Teyvat and find his/her missing brother/sister (depending on who the player chooses to play as). Resource gathering is one of the most important mechanics, as rewards strictly revolve around it. This makes players spend hours collecting items that enemies drop, and checking the game every day so they get the rewards from daily missions. This will further be looked into.



**Figure 17. Genshin Impact logging view. Source: Genshin Impact**

Being an open world game, the possibilities are endless and the developers are constantly releasing events, new missions and new parts of the continent for the player to explore. This is normal, as only two years have passed since the release of the game, the company has lots of material storage so players keep engaging with the game. All of this post-game content (not considered a DLC as it is free) is strongly linked to Gacha.

Gacha video games is a genre that represents addiction from the most basic mechanics. This genre copied the addictive mechanisms of vending machines and implemented it. Farina, Fitriana & Chuin (2021) stated that Gacha games are not addictive by themselves, but it is this key game element that pushes player to addiction. *Genshin Impact* implements this mechanic for obtaining playable characters and weapons.

Genshin Impact has a main story and progression that has been explained above. Once the main quest is completed, one may think that the game has little more to offer. Here is where the developers have taken action, by placing daily challenges and events, so the player maintain the attention on the game. Not to mention the Gacha rewards that are accessible anytime and will not be completed after finishing the game, as new characters and weapons are being featured in the game frequently.

#### 4.2.1 Enemies' Drops

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Everyday enemies will respawn, and every week bosses will respawn. Enemies will drop materials that the player will use to level up their characters, craft other items and unlock events.

Regular enemies drop an item when their health reaches 0%. Additionally, some enemies will drop more than one item, when their health reach the thresholds of 75%, 50%, 25% and 0%. Once a drop is generated between 1 to 3 items may spawn.



**Figure 18. Avatar fighting regular enemies. Source: Genshin Impact.**

**Table 14. Regular enemy drop in Genshin Impact**

Regular Enemy Drop	Assessment
<b>Form</b>	Resource Gathering
<b>Action</b>	Defeating a regular enemy
<b>Quantity</b>	Between 1 or 4
<b>Probability</b>	First spawned items: (75% - 60%) Second spawned items: (50%-33%) Third spawned items: (25%)
<b>Time limitation</b>	No
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	No
<b>Use of the player</b>	Advancement

Bosses have a slightly different mechanism on how to obtain their drops, as the number of items and their value is bigger. The avatars of the player will gain more experience and simple weapons may spawn. In order to claim these rewards, the player will have to use a soft currency that in the game is called Original Resin. One piece of resin is refilled every eight minutes. This reward is explained in Table 15.



**Figure 19. Enemy bounty spawn. Source: Genshin Impact**



## 4.2.2 Levelling up characters

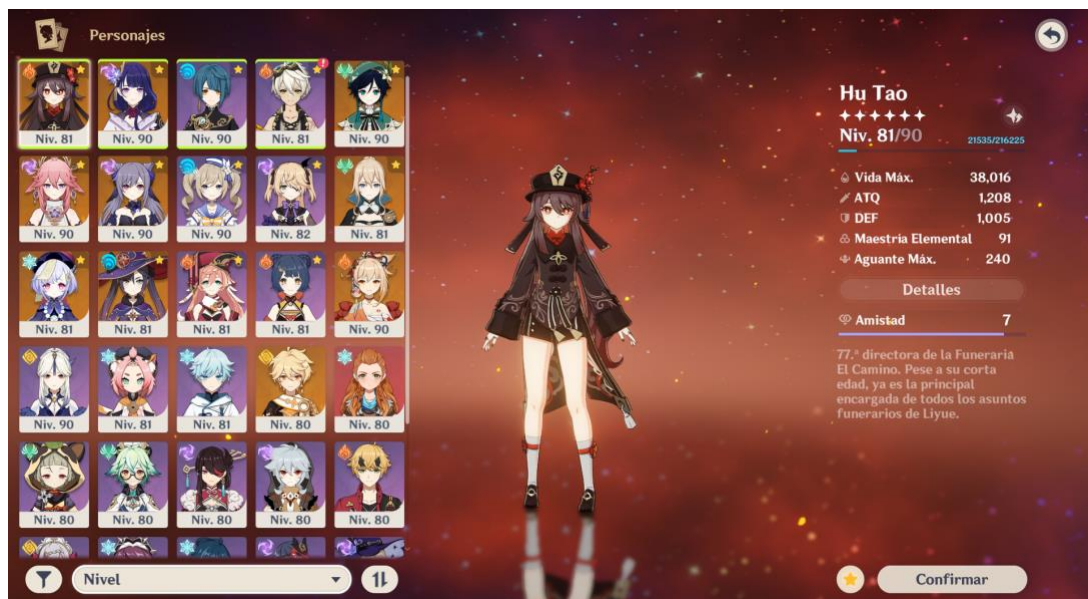


Figure 21. Characters collection view. Source: Genshin Impact

From the resources gathered by the players while slaying enemies, they will collect EXP materials. This specific type of material will allow players to level up their avatars. Levelling up the characters increase their stats: life points, attack and defence.

Table 16. Levelling up characters in Genshin Impact.

Levelling up characters	Assessment
<b>Form</b>	“Level up”
<b>Action</b>	Collecting enough EXP materials
<b>Quantity</b>	1
<b>Probability</b>	-
<b>Time limitation</b>	-
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	No
<b>Use of the player</b>	Advancement

### 4.2.3 Daily Missions



Figure 22. Daily missions view. Source: Genshin Impact

Every day, 4 daily missions will be activated. These missions allow the player to obtain primogems by realizing a simple task: fighting an enemy, finding an object, talking to an NPC, etc. Primogems are the soft currency used in the Gacha, so they are really sought by the players. These missions will not be use by the player for advancement, but yet they are the ones players expect the most.

Table 17. Daily mission completion in Genshin Impact

Completing a Daily Mission	Assessment
<b>Form</b>	Resource Gathering
<b>Action</b>	Completing a specific task
<b>Quantity</b>	10 primogems
<b>Probability</b>	-
<b>Time limitation</b>	Once a day and up to 4 times
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	No
<b>Use of the player</b>	Review



Table 18. Reward for completing all daily missions in Genshin Impact

Completing all Daily Missions	Assessment
<b>Form</b>	Resource Gathering
<b>Action</b>	Completing 4 daily missions
<b>Quantity</b>	20 primogems
<b>Probability</b>	-
<b>Time limitation</b>	Once a day
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	No
<b>Use of the player</b>	Review

#### 4.2.4 Gacha

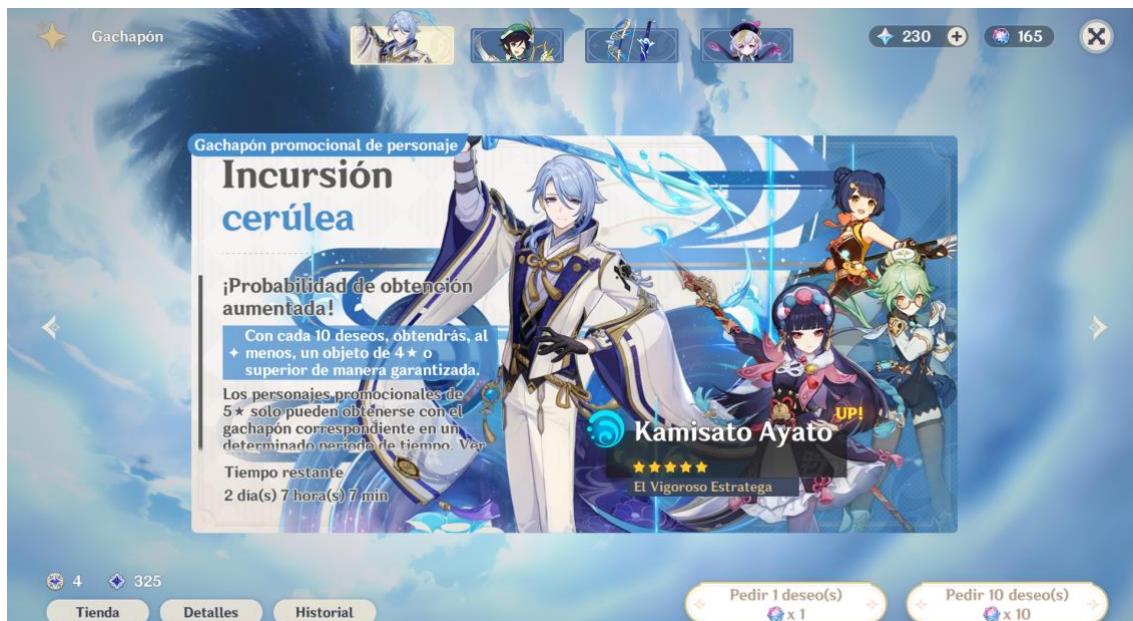


Figure 23. Gacha banner. Source: Genshin Impact

As mentioned beforehand, the main reward and the most attractive for players is Gacha. The term used to participate in the Gacha is roll, as rolling a dice. In exchange of 1 wish, the player will get a random item from the Gacha banner.

In order to obtain 1 wish, the player must exchange it for primogems. There are several ways of obtaining primogems: completing daily missions, in special events or paying for them with a hard currency.

**Table 19. One roll in the Gacha from Genshin Impact.**

<b>Obtaining 1 wish</b>	<b>Assessment</b>
<b>Form</b>	Item granting
<b>Action</b>	Spending 160 primogems
<b>Quantity</b>	1
<b>Probability</b>	-
<b>Time limitation</b>	No
<b>Events</b>	Yes, but not compulsory
<b>Payment</b>	Yes
<b>Internet</b>	No
<b>Use of the player</b>	Review

There are 4 different banners: a permanent one, a weapons one and two corresponding to the special 5 stars character (biggest price of the banner). All of the items that the user can win in the banners are ranked with 3, 4 or 5 stars, being this last one the highest level. The stars correspond the difficulty percentage of obtaining the item. Every 90 rolls the player assures a 5-star character and every 180 rolls the main character of the banner is assure (there may be more than one 5-star character in a banner). The probability increases until reaching 100% for the banner character after 180 rolls.



Table 20. Genshin Impact 3-star Gacha reward.

Obtaining a 3-star item	Assessment
<b>Form</b>	Item granting
<b>Action</b>	Rolling 1 wish
<b>Quantity</b>	1
<b>Probability</b>	94,3%
<b>Time limitation</b>	No
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	No
<b>Use of the player</b>	Review

Table 21. Genshin Impact 4-star Gacha reward.

Obtaining a 4-star item	Assessment
<b>Form</b>	Item granting
<b>Action</b>	Rolling 1 wish
<b>Quantity</b>	1
<b>Probability</b>	5,1%
<b>Time limitation</b>	No
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	No
<b>Use of the player</b>	Review

Table 22. Genshin Impact 5-star Gacha reward.

Obtaining a 5-star item	Assessment
<b>Form</b>	Item granting
<b>Action</b>	Rolling 1 wish
<b>Quantity</b>	1
<b>Probability</b>	0,6%
<b>Time limitation</b>	No
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	No
<b>Use of the player</b>	Review

#### 4.2.5 Events

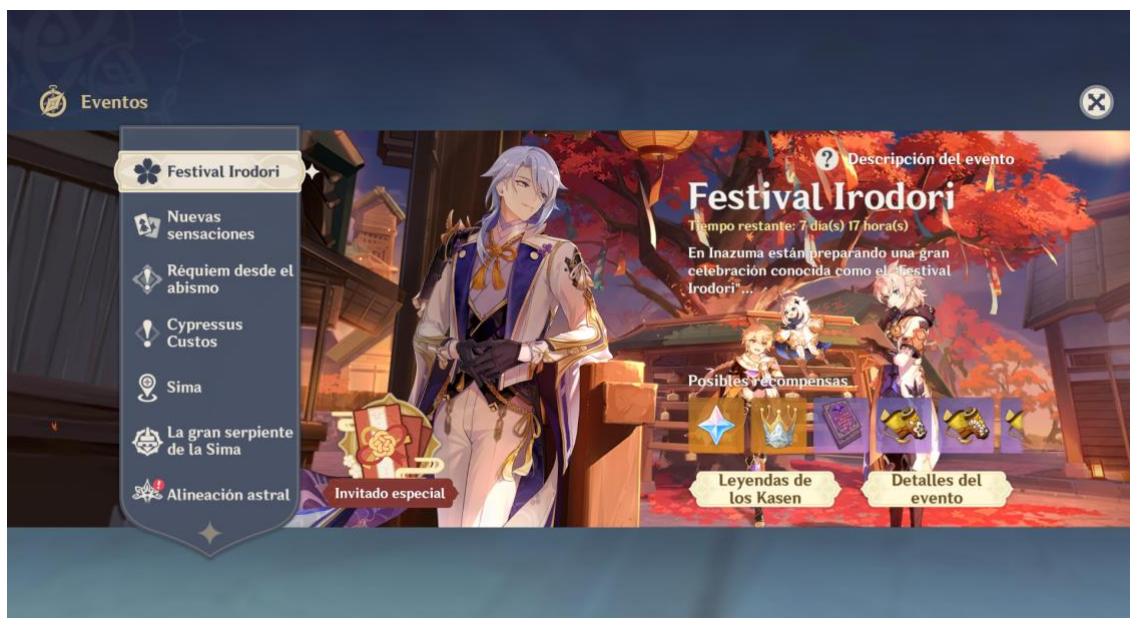


Figure 24. Events banner. Source: Genshin Impact

Genshin Impact includes a special event every two weeks (although some events only a couple of days but not as a general rule). In these events, characters new of the banners are introduced and materials and primogems are winned more easily. A special side quest must be completed to win the rewards.

**Table 23. Event rewards in Genshin Impact.**

<b>Event reward</b>	<b>Assessment</b>
<b>Form</b>	Item granting
<b>Action</b>	Finishing an event
<b>Quantity</b>	1
<b>Probability</b>	-
<b>Time limitation</b>	Yes, two weeks
<b>Events</b>	Yes
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Review and Advancement

#### 4.2.6 Additional Features

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Along with all of the features that to some extent influence the game progression (even when they are not essential but help, such as Review rewards), there are two mechanics worth mentioning. Both of them represent collecting achievements, a reward not yet seen in the study. In the case of Genshin Impact it is noteworthy as allows can engage the player into a deeper gameplay, as customization is present.

First one is cooking. Thanks to the resource gathering from slaying monsters and animals, the player will be unlocking recipes in game. The food that the player cooks can help the avatar to increase their stats for a certain amount of time.

Table 24. Cooking in Genshin Impact.

Completing a recipe	Assessment
<b>Form</b>	Collecting achievements
<b>Action</b>	Cooking a recipe
<b>Quantity</b>	1
<b>Probability</b>	-
<b>Time limitation</b>	No
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	No
<b>Use of the player</b>	Review

Second one is House building. The player gets to experiment with creativity and personalization, characteristics not commonly seen in this video game genre. Furniture can be crafted with Furnishing Blueprints, obtained from participating in events. Once the furniture piece is built, the player can place it inside the house that has been granted.

Table 25. Crafting furniture in Genshin Impact.

Acquiring furniture	Assessment
<b>Form</b>	Collecting achievements
<b>Action</b>	Using a Furnishing Blueprint
<b>Quantity</b>	1
<b>Probability</b>	-
<b>Time limitation</b>	No
<b>Events</b>	Yes
<b>Payment</b>	No
<b>Internet</b>	No
<b>Use of the player</b>	Review

## 4.3 League of Legends

---

*League of Legends* was released in October 2009, and it is a MOBA (Multiplayer Online Battle Arena) created by Riot Games. It is a highly competitive game and one of the most popular one in electronic sports (e-sports). Game declared that between 2019 and 2020, users in Twitch spent over 712 million hours watching LOL streams. This makes LOL the top second viewed video game so far. What is admirable about Riot Games is the ability they had to engage users, even when they are not regular players. The Lore created is huge, with 159 selectable champions by April 2020, each one of them has its own personal story that entangles with the rest. This has allowed Riot to launch books, tv shows, comics and music groups all of them featuring their champions. Champions have a regular aspect, included in the acquisition of them. Additionally, skins (different aspects and colours) are available in exchange of soft currency in the game.

The game is based in matches between teams of 5 players each, where the team that destroys the opponents base will win. Each game is between 25 to 45 minutes long. Inside the game there are lots of mechanics and rewards, but they do not endure over time. That is why it will be studied the rewards post-game, the ones received after a player wins or loses and that affect the overall ranking of players. What pushes LOL players to play is their position, in order to obtain prestige among other players.

### 4.3.1 Ranked

---

Ranked is the term given to LOL games where the player is competing to advance in the global ranking positions. After each game, players will be given points (called lp) when they win and deducted from them. Every Season, players try to score the highest in the ranking. Player will be matched in games with players of the same ranking level.

Table 26. Winning a ranked.

Winning a ranked	Assessment
<b>Form</b>	Score System
<b>Action</b>	Winning a ranked game
<b>Quantity</b>	Between 10-30 LP
<b>Probability</b>	-
<b>Time limitation</b>	1 Year
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Compete



Figure 25. Ranked classification page. Source: League of Legends client.

Table 27. Visual rewards from ranked placement.

Ranked icon and framework	Assessment
<b>Form</b>	Collecting Achievements
<b>Action</b>	Finishing the ranked season in the ranking system
<b>Quantity</b>	1 icon and framework corresponding to the classification
<b>Probability</b>	-
<b>Time limitation</b>	1 Year
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Sociality

Table 28. Skin reward from ranked placement.

Year Ranked Skin	Assessment
<b>Form</b>	Item granting
<b>Action</b>	Ending Gold or higher in the ranking
<b>Quantity</b>	1 Skin
<b>Probability</b>	-
<b>Time limitation</b>	1 Week
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Review and Sociality

### 4.3.2 Levelling up

---

Normal games give the player between 50 to 300 experience points (EXP) for completing a game. First levels are important for making players feel familiarized with the game. In the first levels they unlock masteries, champions and summoner spells, these items are needed in the games, and every normal player has them. It is the way of introducing players to the most complicated stuff and make them feel skilled in the process. The most vital Level that players must reach is Level 30, after that they will be allowed to play Ranked. Rewards from levelling up are stated and are not random. This rewards are represented in Table 29 and Table 30.

**Table 29. Winning experience points in League of Legends.**

<b>Getting EXP</b>	<b>Assessment</b>
<b>Form</b>	Levelling up
<b>Action</b>	Play a LOL game
<b>Quantity</b>	Between 50 to 300
<b>Probability</b>	-
<b>Time limitation</b>	1 Week
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Advancement

### 4.3.3 Missions

---

Missions are reward systems that active when the player completes a specific in-game objective. The rewards given are not decisive for the player, but it gives small profits to them.



Table 30. Levelling up in League of Legends.

Level up	Assessment
<b>Form</b>	Item granting
<b>Action</b>	Earning enough experience points
<b>Quantity</b>	Basic Champion capsule and Glorious capsule every 10 <sup>th</sup> levels.
<b>Probability</b>	-
<b>Time limitation</b>	-
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Sociality and Advancement

#### 4.3.3.1 Daily Mission

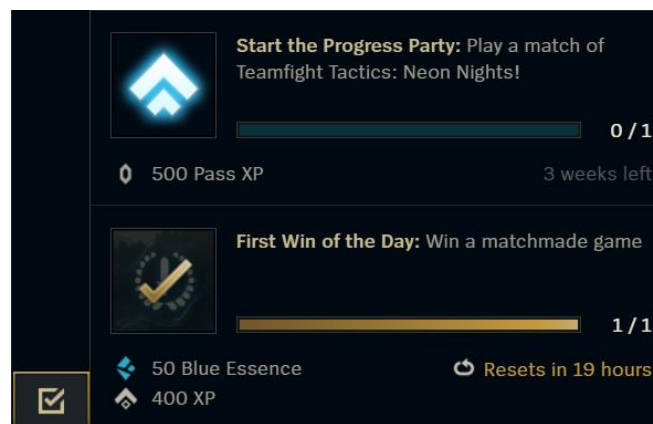


Figure 26. Daily missions' screenshot. Source: League of Legends client

The only mission permanent is the “First Win of the Day”. As seen in the Figure 26 it gives the player experience and soft currency. It is a small amount compared to other rewards in the game, but it is a safe reward that players have every 20 hours.

Table 31. First win of the day in League of Legends.

First Win of the day	Assessment
<b>Form</b>	Item granting
<b>Action</b>	Winning one game
<b>Quantity</b>	400 EXP and 50 blue essences
<b>Probability</b>	-
<b>Time limitation</b>	Reset every 20 hours
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Advancement and Review

#### 4.3.3.2 Event Missions

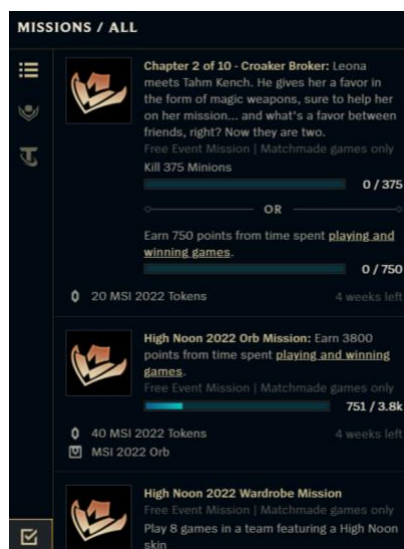


Figure 27. Event missions' screenshot. Source: League of Legends client.

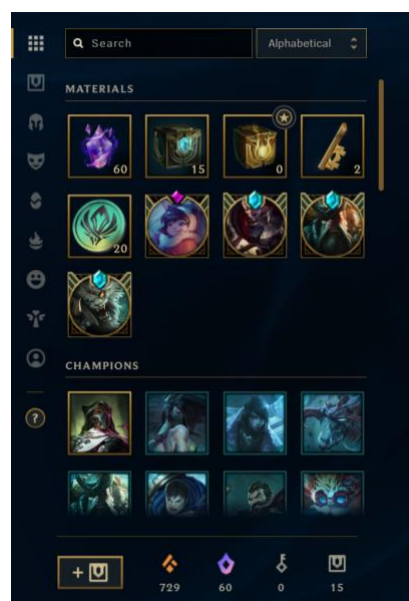
The other type of missions is “Event Missions”. When the play launches a new event as a competitive professional tournament or a new set of skins, the launch comes with missions and their on-reward points. The points earned from completing these missions can only be used while the event is active. With these points, player can purchase

normal soft currency of the game, capsules, chests and keys or even exclusive items of the event. Some examples of missions are killing a certain number of times inside the match, or earning a specific amount of money in-game.

**Table 32. Completing an event mission in League of Legends.**

Complete an event mission	Assessment
<b>Form</b>	Item granting
<b>Action</b>	Completing an Event mission
<b>Quantity</b>	Between 20 to 60 even points.
<b>Probability</b>	-
<b>Time limitation</b>	From 2 weeks up to 1 month
<b>Events</b>	Yes
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Review

#### 4.3.4 Chests and Keys



**Figure 28. Loot page. Source: League of Legends client**

Chests inside League of Legends were released in 2016. Player can obtain fragments keys thanks to resource gathering in missions and inside capsules. With three fragments of a key the player can open the chest. There are several items that the chest may contain.

**Table 33. Opening a chest in League of Legends.**

<b>Open a chest</b>	<b>Assessment</b>
<b>Form</b>	Item granting
<b>Action</b>	Using a key
<b>Quantity</b>	1 item
<b>Probability</b>	Skin shard (50%) Champion shard (25%) Ward skin (11,5%) Emote (10%) Summoner Icon Shard (3.5%)
<b>Time limitation</b>	1 Week
<b>Events</b>	No
<b>Payment</b>	Yes, keys and chests can be purchased
<b>Internet</b>	Yes
<b>Use of the player</b>	Review and Sociality

#### 4.3.5 Prime Gaming

---

Lastly, the most profitable way of reward for players is the Prime Gaming Capsule. Players who have an Amazon Prime account can link it with their League of Legends users. It is important to have in mind that Amazon Prime cost 4,99 per month actually. Every month, Prime users will receive a capsule containing a variety of items. It is an exclusive effortlessly reward, as it does not require to complete a mission in game, only to pay money. But yet, the randomness in it is exciting for players, as well as the

“free” riot points (rp, soft currency of the game obtained only in exchange of real money except for counted occasions). Players have a sense of achieving for free a currency that normally will cost real money, even when they are somehow paying for it with the amazon subscription

**Table 34. Prime Gaming capsule.**

<b>Prime Gaming capsule</b>	<b>Assessment</b>
<b>Form</b>	Item granting
<b>Action</b>	Claim the prime gaming capsule
<b>Quantity</b>	650 rp Permanent skin (value of 1350 rp) 200 orange essence 5 champion fragments 2 effigy fragments 30 days EXP bonus
<b>Probability</b>	-
<b>Time limitation</b>	1 Month
<b>Events</b>	No
<b>Payment</b>	Yes
<b>Internet</b>	Yes
<b>Use of the player</b>	Review and Sociality

#### 4.4 World of Warcraft

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*World of Warcraft* is a MMORPG created by Blizzard Entertainment and released in November 2004. The game is still very popular as we have seen previously in this article and its latest expansion, *Dragonflight*, was announced to launch in 2022. Wow is a referent in the gaming community, as one of the first MMORPG and considered by

most the best one. It is a generational legacy that will remain in time, as it is currently achieving it.

In Wow, the player controls an avatar. He/she gets to explore the universe, complete missions, fight monsters and other players and interact with their surroundings (NPC and other players). As the avatar gets stronger and levels up, the player will be able to fight stronger monsters, have better equipment and unlock more areas. The personalization of the avatar oscillates between two options. First the player gets to choose between 13 races, that will determinate their aspect and territories inside the universe where they belong. Secondly the role, that configures the combat mode.

The universe of World of Warcraft has been expanded widely since 2004. The developers of this game have launched 8 major expansions packs, where Dragonflight will be the 9<sup>th</sup> one. Each expansion pack unlocks a new area to explore, with their own dungeons, raids, special items and reputation system. The most important is that expansions add new campaign missions, making this way the game progression advance for player who have already completed the main story. Each expansion is composed of 3 patches, for example last expansion has 9.0, 9.1 and 9.2 patches. Patches produce new content for about 3 to 4 months, and the time between patches is of half a year more or less. Every week a new chapter of campaign missions from the patch is unlocked. When the expansion is not producing new content, the areas and objects are still available during that time for the player to explore and collect.

#### 4.4.1 Reputation and Daily Missions

---

The most social form of reward in World of Warcraft is Reputation. Reputation is intrinsic of each zone, meaning that the reputation that a player acquires in one expansion is not transferable to another. Players can win interaction from playing and interacting with each other. The reputation points unlock social interaction within the community and allows the player to have a permanent discount every time a level of Reputation is surpassed. The most stable way to obtain reputation is through daily missions.



Figure 29. Reputation daily missions. Source: World of Warcraft

Table 35. Completing a daily mission in World of Warcraft.

Completing a Daily Mission	Assessment
<b>Form</b>	Item granting
<b>Action</b>	Completing a specific given task
<b>Quantity</b>	10 Reputation points
<b>Probability</b>	-
<b>Time limitation</b>	Once a day and up to 5 times
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Advancement

#### 4.4.2 Player versus player (PVP)

One of the main game modes is the PVP inside WOW. It is a small MOBA inside the game, where players team up in pairs or threesomes and compete against each other. Only the winning team of the battle gets a reward. These wins do not affect the main storyline, but they do affect the ranking of the PVP system inside of WOW.

Table 36. Winning a PVP battle in WOW.

Winning PVP battle	Assessment
<b>Form</b>	Item granting and
<b>Action</b>	Wining a battle
<b>Quantity</b>	PvP vendors, honor and conquest points.
<b>Probability</b>	-
<b>Time limitation</b>	No
<b>Events</b>	Yes
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Compete

Table 37. Wining PVP titles in WOW.

Winning a PVP title	Assessment
<b>Form</b>	Collecting Achievements
<b>Action</b>	Wining a battle
<b>Quantity</b>	1 Associated title
<b>Probability</b>	-
<b>Time limitation</b>	No
<b>Events</b>	Yes
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Compete

The rewards obtained in PVP battles can only be used for the inside PVP mode. Conquest and honor is the currency inside this system to purchase armours and items (as mounts and pets).





Figure 30. PVP header. Source: Blizzard Entertainment

#### 4.4.3 Dungeons and Raids (PVE)

There are two main game systems of PVE (player versus engine) in WOW, dungeons and raids. In both of them players cooperate with each other in order to beat a common enemy.



Figure 31. Dungeon map. Source: World of Warcraft

In the case of Dungeons, the time oscillates between 1 hour and 3 hours. The group has that given time to successfully complete the dungeon. For that, they will need to defeat 4 bosses and normal enemies that will spawn along the way. Only the top 3 from the group will receive the reward of completing the dungeon. Each dungeon has a variety of objects that can be granted to the players, so they can try and complete them again to obtain them all (or one that they are interested in). These items allow players to improve their stats, as they can equip them.

**Table 38. Completing a Dungeon in WOW.**

Completing a Dungeon	Assessment
<b>Form</b>	Item granting
<b>Action</b>	Wining a battle
<b>Quantity</b>	1 random item
<b>Probability</b>	60%
<b>Time limitation</b>	Yes, between 1 hour and 3 hours.
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Cooperate



**Figure 32. Raid fight screenshot. Source: Bajheera (2020), YouTube**

Raids also encourages players to cooperate, only this time groups can be of up to 20 members. Rewards in Raids are much more rare and powerful items, as they are specific to the enemy you are trying to beat. One Raid takes about 3-4 hours to complete, and players will only have to defeat one Boss.

**Table 39. Defeating a boss raid in WOW.**

<b>Completing a Raid</b>	<b>Assessment</b>
<b>Form</b>	Item granting
<b>Action</b>	Completing a Raid
<b>Quantity</b>	1 item
<b>Probability</b>	25%
<b>Time limitation</b>	Once a week
<b>Events</b>	Yes
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Cooperate

#### 4.4.4 Weekly Rewards

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“The Great Vault” is the system of weekly chest rewards in WOW, more specifically in Shadowlands. Players will be rewarded with an extra gear from the Raids, Dungeons or PVP game modes. Up to 9 gear will be displayed in front of the player, but only one can be selected. The loots available will be unlocked after completing a small mission:

**Table 40. Unlocking raid loots from The Great Vault.**

<b>Unlock Raid Loot</b>	<b>Assessment</b>
<b>Form</b>	Unlocking mechanism
<b>Action</b>	Defeat 2 Raid Bosses Defeat 5 Raid Bosses Defeat 8 Raid Bosses
<b>Quantity</b>	1 loot unlocked for each action
<b>Probability</b>	-
<b>Time limitation</b>	1 Week
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Review

**Table 41. Unlocking dungeon loots from The Great Vault.**

<b>Unlock Dungeon Loot</b>	<b>Assessment</b>
<b>Form</b>	Unlocking mechanism
<b>Action</b>	Complete 1 Dungeon Complete 4 Dungeons Complete 8 Dungeons
<b>Quantity</b>	1 loot unlocked for each action
<b>Probability</b>	-
<b>Time limitation</b>	1 Week
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Review

Table 42. Unlocking PVP loots from The Great Vault.

Unlock PVP Loot	Assessment
<b>Form</b>	Unlocking mechanism
<b>Action</b>	Earn 1250 Honor Points Earn 2500 Honor Points Earn 5500 Honor Points
<b>Quantity</b>	1 loot unlocked for each action
<b>Probability</b>	-
<b>Time limitation</b>	1 Week
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Review

Once the time limitation of 1 week has passed, only the loots unlocked will display a random item. All the gears generated are calculated according to the level of the actions completed. The difficulty of the PVP, Raids and Dungeons will affect the value of the gear.

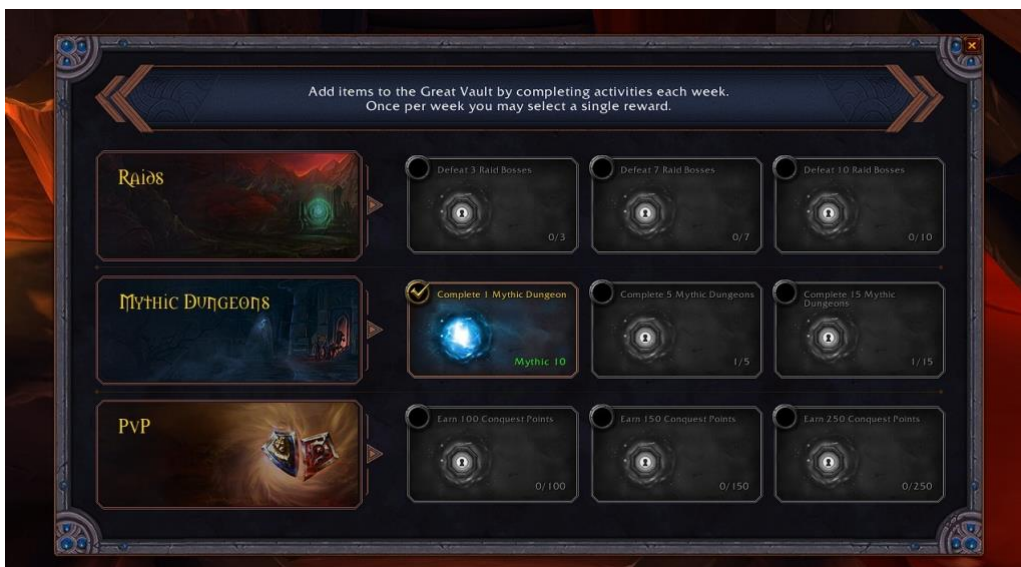


Figure 33. The Great Vault screenshots. Source: World of Warcraft

**Table 43. Getting a weekly reward from The Great Vault.**

<b>Reward from The Great Vault</b>	<b>Assessment</b>
<b>Form</b>	Item Granting
<b>Action</b>	Completing at least one loot mission
<b>Quantity</b>	1 gear
<b>Probability</b>	-
<b>Time limitation</b>	One every week
<b>Events</b>	No
<b>Payment</b>	No
<b>Internet</b>	Yes
<b>Use of the player</b>	Review

## 5. Discussion of results

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After conducting the analysis of all four games, the results can be interpreted, allowing us to draw pertinent deductions. It is interesting to observe the results of each game individually and later on construct general statements from the observations that were made. The statements that are concluded here will be compared with a small close survey done to the population. Survey respondents were asked about their preferences in the four games regarding the rewards available, only if they have played the game in question. This survey won't act as a source of conclusions, but it will be interesting to see if the deductions achieved in the analysis concur with the survey's ones. This survey is the one described in section 3.2 Survey Design.

After conducting the survey, a total of 63 answers from gamers were registered. It is worth noticing that all of the video games have been played by more than the 30% of respondents. League of Legends was the most played video game among the four of them, with a 68,3% and Genshin Impact the less played with a 32,3%. All participation rates can be observed in Figure 34, Figure 36, Figure 39 and Figure 41.

In the case of Candy Crush Saga, it is interesting to see how everything revolves around completing a level. Obviously, in the case of mobile games some limitations exist around how complex a video game could be. At first glance, Candy Crush may be seen as a simple lineal game, but developers have taken advantage of this.

From all of the rewards studied in Candy Crush, 9 out of 11 involved completing a level to a greater or lesser extent. There are the direct rewards obtained from completing a level and there are also the rewards that the player may win if he completes enough levels. It can be seen that to win most of the rewards, the player must keep completing levels, or what is the same, the player must keep playing the game. It is a smart approach to keep players motivated, in what it may seem to some people as a boring repetitive video game.



The rewards that do not require the completion of levels are rewards that help the player to complete the levels. This way, the global life cycle surrounds the same mechanic: to complete a level. All the efforts and attention of the player will be putted into that, in order to achieve better results.

As shown in the survey, when players were told to choose between their favourite's rewards, 76,3% of the answers were "Complete a Level". Weekly Challenges also have a strong presence, whereas mentioned before, in order to win these players must complete several levels.

Have you ever played Candy Crush Saga? (¿Alguna vez has jugado al Candy Crush Saga?)  
63 respuestas

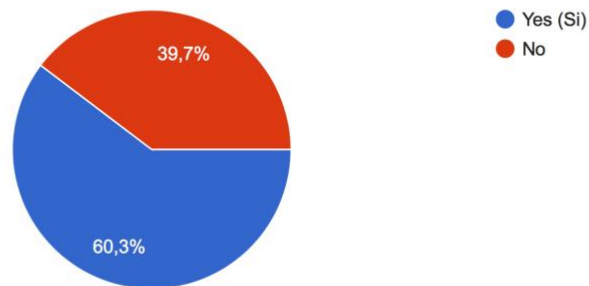


Figure 34. Candy Crush participation rate. Source: Conducted Survey

From this selection, what are your favorites mechanics in Candy Crush? (De estas opciones, ¿cuál es o cuáles son tus sistemas favoritos en el Candy Crush?)  
38 respuestas

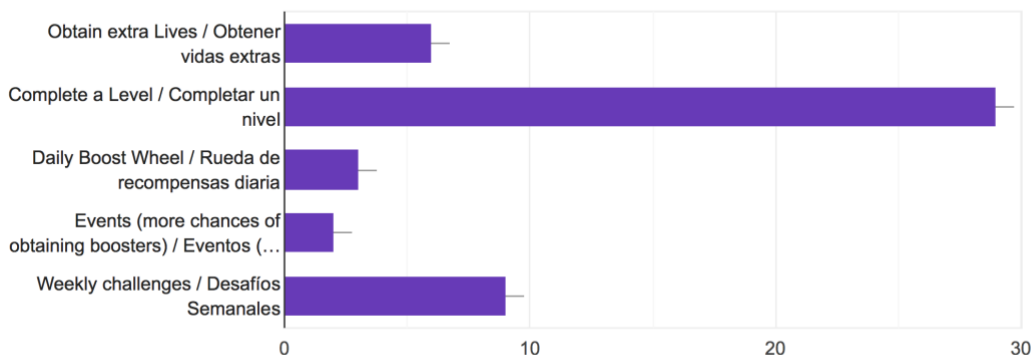


Figure 35. Candy Crush survey results. Source: Conducted survey



For the case of Genshin Impact, we already have a core reward proved as successful implemented, which are the Gachas. The main missions and objectives of the story can be completed in a media of 30 hours approximately. Slow players will take about a month to complete it. But players keep playing Genshin Impact still. One of the main reasons why players keep playing is to complete the collection of characters, or to get a specific unit from the Gacha.

Even though Genshin Impact's main story is completed, new expansions are planned and being released. New areas yet to explore and enemies to beat are launched every time an update of the game is implemented. This, allows players to face stronger enemies as time goes by and creates a reason for them to level up their characters and to try to obtain better avatars. The constant pounding of new challenges and the constant expansions of the world maintains the player entertained and gives them a reason to keep playing.

The rewards studied in Genshin Impact are varied, as the game presents certain complexity. But there is a redundant element that appears in the rewards, primogems. As mentioned before, primogems are the soft currency needed to participate in the Gacha banners. There is a limit established to obtaining primogems and that limit is time. Apart from real money, where the company increases profits. Making the most desired reward restricted by time encourages the player to play once the restriction has expired. Two main time limitations exist. The first one is presented in daily missions, that must be completed once in a day, giving the possibility to the player to obtain up to 60 primogems. Second one is events, where the player has two weeks to complete certain task in exchange of various rewards, including primogems. The case of daily missions is crucial, as the player will need to complete all daily missions for at least 3 days to have a roll in the Gacha banner. The developers make sure to have the player engaged for 3 days, although not for a long time as the missions are easily completed.

In the survey, it can be observed that in general, all rewards are popular among players. It is not surprising to find this in a new released game that has become widely known. The game is expected to be well rounded and to have different features that may

attract players. There should be special attention payed to participating in the Gacha Banner, that it is considered one of the best by respondents (42,9%)

Have you ever played Genshin Impact? (¿Alguna vez has jugado al Genshin Impact?)  
62 respuestas

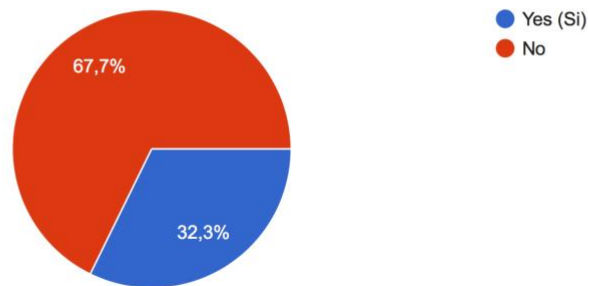


Figure 36. Genshin Impact participation rate. Source: Conducted survey.

From this selection, what are your favorites mechanics in Genshin Impact? (De estas opciones, ¿cuál es o cuáles son tus sistemas favoritos en el Genshin Impact?)  
21 respuestas

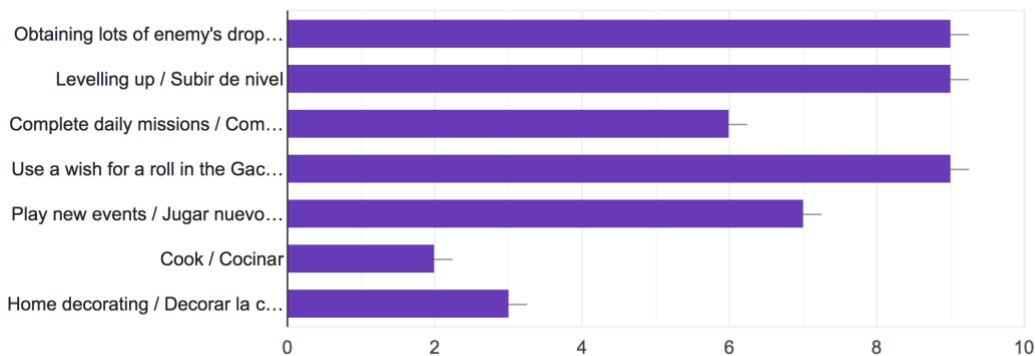


Figure 37. Genshin Impact survey results. Source: Conducted survey.

League of Legends is a game where obtaining the main reward is not always a thing achieved by players. The main objective of the game is to win games, so the player can accumulate points (lp) and climb up in the global ranking. Even though users can expend years playing, this is not a guarantee that they will advance in the ranking position. LOL also plays with this feeling of frustration that increases the discharge of dopamine in the body. Players need to be very skilful in order to play in bigger leagues of the ranking. This is why most of them are stuck and play in beginners rankings.

By seeing the rewards, it is clear that most of them do not revolve around the ranking system. Lots of the rewards are related to obtaining items in game or accordingly, items that unlock features that players can use in the game. As improving is not always possible, players improve their experiences with skins or chromas. They cannot show off with other players from their ranking, so they do it changing the aspects of champions in the game. Skins and chromas are items believed to be obtained by purchasing them with money, but they can be obtained from chests and others rewards (as events or prime). When players cannot boast about their skills in game, they pretend to have enough money to spent in the game. They get prestige from one place or another.

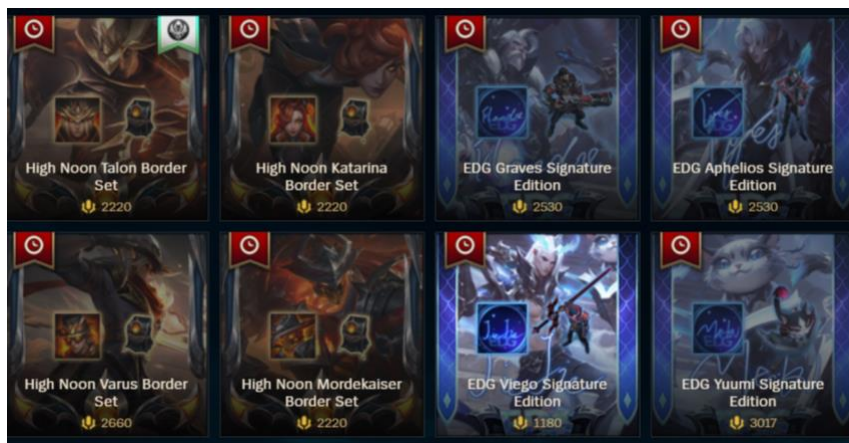
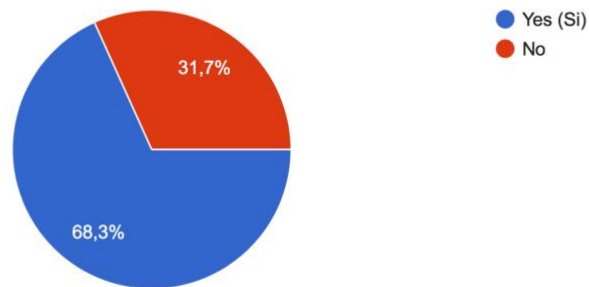


Figure 38. League of Legends shop, latest skins released. Source: League of Legends client.

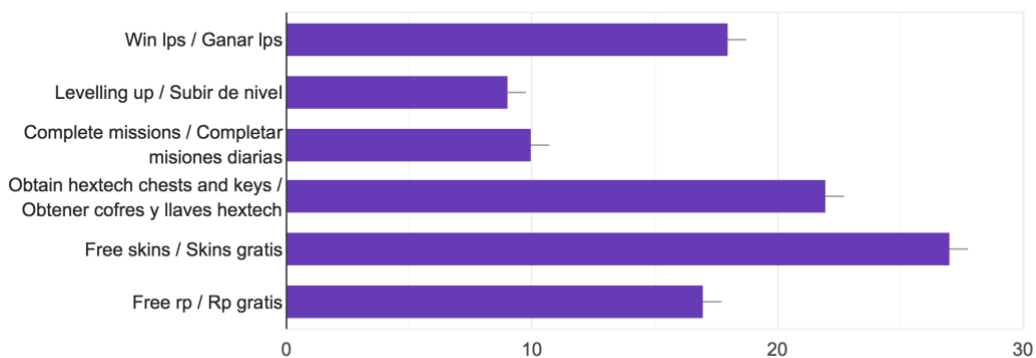
In the survey, League of Legends was the most voted game. This means that the most played video game among all the respondents was LOL. The most popular option in the survey is getting Free skins, even more than winning lps. This reinforces the theory that players who are not skilful get prestige from other sources. The element of getting one skin randomized combines the feeling of fulfilment and the presence of dopamine.

Have you ever played League of Legends? (¿Alguna vez has jugado al League of Legends?)  
63 respuestas



**Figure 39. League of Legends participation rate. Source: Conducted survey.**

From this selection, what are your favorites mechanics in League of Legends? (De estas opciones, ¿cuál es o cuáles son tus sistemas favoritos en el League of Legends?)  
43 respuestas



**Figure 40. League of Legends survey results. Source: Conducted survey.**

Finally, there are World of Warcraft's rewards. This game has pretty solid game options defined. The PVP and PVE (that includes Raids and Dungeons). The rewards that can be obtained from this mechanics are strictly defined and in order to obtain them, the player must spend a considerable number of hours. In addition, the element of the reward is not always guaranteed when completing these. What it is guaranteed is unlocking loots by playing this game options, so at the end at least one reward can be obtained by the players.

The way to maximize the number of rewards is to play the game more. If the players cannot obtain their desired item, they can always keep playing. This is beneficial for developers, but can be very dangerous for players. Each game option requires lots of

hours, to only obtain (if the player is lucky) one item. Here is where case of addiction are found, as to every try to get an object implies between 2 or 4 hours.

When players were asked in the survey about their preference, the following results were obtained (see Figure 42). It is visible how players enjoy more playing Raids and Dungeons, which are the more immediate way of reward. They prefer to obtain the reward from their effort and time spent rather than by luck at The Great Vault. It is important to remember that faster way of reward still has the key factor of randomness.

Have you ever played World of Warcraft? (¿Alguna vez has jugado al World of Warcraft?)  
62 respuestas

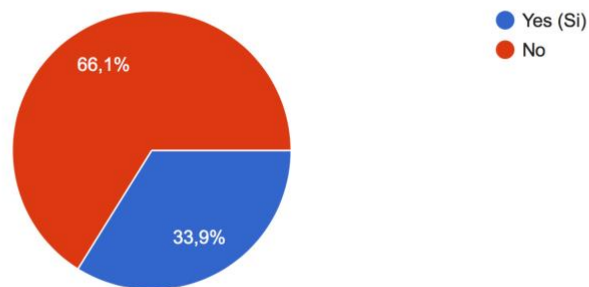


Figure 41. World of Warcraft participation rate. Source: Conducted survey.

From this selection, what are your favorites mechanics in World of Warcraft? (De estas opciones, ¿cuál es o cuáles son tus sistemas favoritos en el World of Warcraft?)  
22 respuestas

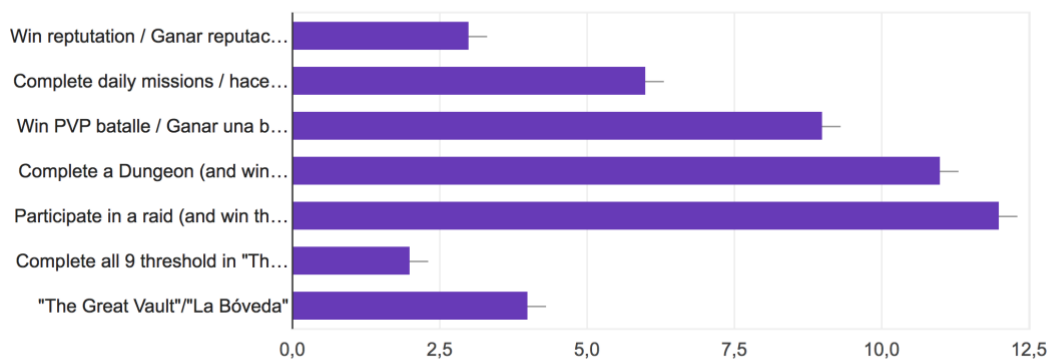


Figure 42. World of Warcraft survey results. Source: Conducted survey.

From all the analysis made of all these four video games, some general conclusions can be made:

First of all, it is remarkable the small amount of Advancement Rewards in the games. Game progression is very much calculated in these games, even in Candy Crush where it can seem infinite. The amount of time strictly required for completing the game objective is little in comparison with review/sociality rewards. Most video games have a main path or a story line for the player to follow. Once completed, if the games have no other content to be done, the players will move on to other game. In all of these games, the rewards do not limit itself to the main game path, and in fact they explode late-game content. Advancement rewards are limited and strongly connected to linear progression. Review rewards are the ones that extend the useful life of the game.

In relation to this topic, it is worth mentioning the presence of events in video games. It is the perfect solution to prolongate the time spent in a video game. Not only it is seen in multiplayer games, but also in single player ones. Events come with a time limitation that urges the player to increase the amount of time they spent playing.

Regarding money spent in the game, apart from World of Warcraft that comes with a needed payed subscription for playing, of 12.99€ per month, the rest of the games are free to play. However, all of the games admit micropayments, but it is curious to see where they are applicable. Micropayments affect exclusively to casual rewards, and mostly to rewards with a randomized element incorporated. Players cannot exchange money in order to advance in the game. The value of player's skills remains pure, even though they can acquire improved gears that help them in game. This is very important to maintain the balance of competition in multiplayer games.

Finally, it is also appreciable the tendency for randomized items in all of these games. This mimic the slot machines mechanisms mention earlier. It is expected that this is one of the favourites methods of rewards for players. Even subconsciously, players cling into them. It has been noticeable how much developers work around Casual rewards, and are always trying to expand and update them to keep the player busy and entertained.

## 6. Conclusion

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This project started remarking the importance of defining the term of addiction, in order to establish a proper context of the study. In today's society, people tend to categorize the use of video games as an addiction very quickly, without understanding the real repercussion of this word. Some objectives were settled, to help determining the success of the study and to see if video games can really be addictive. These objectives will be later reviewed in the following paragraphs.

The term addiction and video games were studied in the theoretical framework. Addiction appears when the human body seeks desperately for the release of dopamine, which can happen with any behaviour that triggers the feeling of survival from people's brains. Having this in mind, the reward systems were chosen as a subject of study, as they have been already linked to the release of dopamine. In the case of video games, a classification was made: Single player video games, Multiplayer video games, MMO and MMORPG.

In order to conduct the analysis, it was necessary to firstly construct it under the knowledge obtained from the theoretical framework. Four video games were chosen: Candy Crush Saga, Genshin Impact, League of Legends and World of Warcraft. These four games represent each of the categories mentioned before of video games. What also makes these games interesting to be part of the study, is the repercussion they have. In March 2022, more than 5 million people have played each of these video games. The study was conducted in games that are actually influential in the gaming society and can make an impact on the population. Some parameters about rewards were defined in the design of the analysis, this way it is easier to look at them.

The analysis highlighted the main rewards of the four games, as well as briefly introduced them to understand how they worked. In the case of Candy Crush, most of the rewards involved completing a level, which is a task that takes a small amount of time (2 to 3 minutes). For Genshin impact, what stands out the most is the Gacha mechanics.

These were based in slots machines, already a renowned source of addiction. With daily small tasks and participating in weekly events, players can obtain the currency needed to participate in the Gacha banners. This assures that the players will keep playing the game daily but in small amounts of time (30 minutes to one hour) in between updates, where lot of new content is release. In League of Legends, what urges the players the most is collecting champions and their variations, even if this acquisition is randomized. Climbing in the global ranking of League of Legends requires lots of skill, so players mostly find satisfaction in this initial feature. Finally, for World of Warcraft it was shown that a strong need to purchase items keeps players busy for hours. All of their rewards require the player to spend hours in game to obtain them. In all of them the item given is selected randomly.

It is worth highlighting that the conclusions of the analysis reveal that players prefer Casual rewards, as those are the ones most present in games. Casual rewards are all of the rewards that not affect the main progress of the game. Progress rewards are known as the necessary rewards to finish the principal objective of the game. It is also noticeable that the factor of randomness is present in all of the games and in some of them, it is even the only way of getting a specific reward (as in characters and weapons in Genshin impact and every item in World of Warcraft). Randomness is the hook that catches the players, and despite obtaining rewards instantly or after a long time, in well design video games the addiction is guaranteed.

One solution to avoid addiction regarding the rewards mechanism, is to put limitations into the time the player can play or obtain the rewards. In the study this was already observed, for example in the Life System of Candy Crush or Daily Missions present in LOL and WOW. However, the intentionality of this limitations is not to avoid addiction, their intentionality is to attract players even more. Limitations are a good starting point to stop video game addiction, but it is extremely important to study the intention which developers created them.

There are many possible future lines to continue this study. What is now most important is to establish a relation with engineering and psychology and to involve phycologist actively in the process of creating video games. Not only to benefit the



companies when they create new media products, but to draw a limit between what is morally acceptable in design and what is not. This way bad forms of video game usage and addiction can be prevented more effectively.

It is also interesting to see how these elements of game design trigger persons with mental disorders or communication struggles. Medicine is starting to pay attention to video games and studying their effects, both positive and negative ones. It is always highlighted the negative consequences of video games that come along with addiction, such as weight loss, worsen symptoms of depression and possible psychiatric disorders. But it has also been proved that they help to ease and treat symptoms of mental disorders, and is a resourceful method to aid therapists (Izzat & Fitriana, 2021).

Moreover, something that it is already being worked on is education with video games. Children are attracted to electronic devices and this curiosity can be taken into advantage to approach new education methods for the new generations. It is a good mechanism that should be exploited instead of denying new technologies into the field of education.

Checking the previous raised objectives, it can be concluded that they have been satisfactorily fulfilled. The theoretical framework has been presented and the analysis conducted. Top 4 games in today's industry have been studied deeply, in particular their reward system. The strongest impact of reward has been declared to be casual rewards, as they have the greatest impact on players.



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## Glossary

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- **Boss:** Especially strong enemy in video games that grants more valuable rewards.
- **DLC:** Stands for *Downloadable Content*. Every additional content that can be installed by the player after finishing the game. An expansion pack of a video game that usually cost additional money.
- **Gaming:** The activity that a person preforms when playing a video game.
- **Hard Currency:** In video games this term is applicable to all the currencies that the player obtains from a real payment. They are valuable sources of items and gears and players can speed up their process of obtaining by spending real money.
- **Lore:** Knowledge and tradition on a subjected heled by a specific group of persons. Usually transmitted by word of mouth.
- **NPC:** Stands for *Non-Player Character*. All characters in a game that cannot be controlled by the input of the player. This character is controlled by the logic of the game and has predetermined behaviours.
- **RPG:** Stands for *Role-playing game*. RPG is a genre of video games with multiple genre variations. The main element of this root genre is when the player controls a character that has to complete an important quest inside the fictional world of the video game.
- **Soft Currency:** Money in game with a low value and that is easily obtained. Soft currency is easily obtained in the video game and can grant the player general-purpose items.

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