Pay-to-Win Loot Boxes and their impact on players' experience

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This research investigates pay-to-win loot boxes and the impact they have on players' experiences in video games. As the popularity of video games has been on the rise in the last two decades, the revenue generating methods have evolved alongside it. With the emergence of microtransactions we have seen plenty of different implementations of monetization methods, which include the pay-to-win microtransactions and pay-to-win loot boxes. Despite the prevalence of these microtransactions, they have received negative feedback, as the impact they can have on competitive gameplay is apparent.

This thesis attempts to discover the perceptions of players to analyze and understand the players' experiences towards these microtransactions and specifically pay-to-win loot boxes. This study employs a pre-gameplay questionnaire, a tailored demo game, and a post-gameplay questionnaire. The purpose of the employed game is to demonstrate the effects of loot boxes in a gameplay environment, mainly for the participants without previous experience on the subject. The purpose of the questionnaires is to inquire about players' experiences, expectations, and the changes in them prior and post the gameplay. The results of the questionnaires will then be analyzed using mixed-methods analysis, as the questionnaires contain both quantitative and qualitative questions.

The results showed that the participants' experiences had no significant changes after the gameplay, and that their expectations as well as experiences prior to the game had been negative towards the pay-to-win loot boxes and the pay-to-win microtransactions. The main reason being the impact towards competitive gameplay, especially in the case of player-versus-player games, while the only positive insights on this type of microtransactions were directed towards single-player games, such as the presented demo game.

These findings suggest that game developers should consider which types of microtransactions their games include, as the pay-to-win models can steer players away even before they have tried the games.

Key words: Pay-to-win, Loot boxes, Microtransactions, Video games

Table of contents

1 INTRODUCTION

The popularity of video games has been rising in the 20th century, as the games have become a more mainstream type of entertainment in the last decade. The rise of mobile games introduced an easy access to different kinds of video games, as well as the evolution of mobile devices has made it possible to go from light pixelated video games to massive multiplayer online role-playing games (MMORPGs). The monetization methods of video games have also changed in the process. Going from the traditional pay-to-play games where the game is sold once and then the player has access to it without additional payments, to subscription-based games with monthly fees, and then towards free-to-play games with additional purchases within the game, microtransactions.

Microtransactions gained popularity especially in the free-to-play game category, while in the recent years they have also become a part of the traditional games as additional content. The monetization in video games has taken different forms of microtransactions, such as loot boxes, game passes, or premium currency. Although premium currency has been around for the longest, it has been used as a means of transferring real money into the in-game premium currency, which then can be used to buy different kinds of in-game goods. Buying game passes often introduces a way to achieve extra rewards and faster game pass experience overtime, while not buying the game pass still awards some rewards at a slower pace. Loot boxes offer the player a game of chance as they contain a pool of rewards from which the player is awarded one or more rewards per unlock. The rewards are often rated by rarity, where the most valuable and desired rewards are hard to come by. This random reward mechanism is often equated to gambling, as the player pays for a chance of receiving the wanted reward without a guarantee. While in gambling the player has a chance of losing the money spent, with loot boxes the player is always awarded something from the reward pool.

Some video games offer only cosmetic rewards such as altering characters' looks, but microtransactions can also have elements of pay-to-win, where the player can spend money in exchange for rewards that affect the gameplay directly, reduce the required time to achieve in-game goals, or increase the available playtime set by gameplay limiters. The pay-to-win aspect is a controversial topic, as the players willing to spend money might end up with a competitive advantage over other players. It can also affect the enjoyment of those not willing to spend money as they might progress slower, making the game seem unfair.

This thesis investigates the concepts of fairness, enjoyment, and player experience in video games that incorporate pay-to-win loot boxes. Central to this inquiry is our research question:

How do pay-to-win loot boxes influence players' experiences and perceptions of fairness within these games?

By focusing on this question, the study aims to illuminate the impact of these monetization strategies on player experience and satisfaction. The study uses a demo video game for introducing the players to the randomized rewards of pay-to-win loot boxes. However, due to ethical considerations, requiring participants to spend money for a research project is not feasible. Therefore, players of the demo game are provided with free in-game keys to unlock the loot boxes and gain an understanding of their mechanics. Additionally, the research uses two questionnaires for inquiring about the participants perceptions towards the pay-to-win mechanics before and after playing the demo game.

In Chapter 2, we will take a brief look into the history of microtransactions and how they became an important monetization strategy for video game developers, then we will inspect the specific type of microtransactions related to gambling, loot boxes. After that, we will explore the pay-to-win monetization in video games, focusing on examples of different types of pay-to-win implementations. We will also explore literature regarding loot boxes, pay-to-win microtransactions, and their combined impact on players' experience in video games as well as their perceptions of them.

In Chapter 3, we will inspect the methodology and research design that is used to conduct pay-to-win loot box simulation in a video game as well as the pre- and post-gameplay questionnaires for the participants, regarding the topic of this thesis.

In Chapter 4, we will take a closer look at the design and mechanics of the video game demo that was used for this research. Then we will present and explore the results of the questionnaires in Chapter 5.

In Chapter 6 we will discuss the presented findings and analyze the results of the questionnaires covered in Chapter 5, and inspect the relation of our findings in comparison to previous literature we explored in Chapter 2.

Finally in Chapter 7 we conclude the research with a summary of our findings, discuss some of the limitations encountered in this research, and provide recommendations for future research.

2 LITERATURE REVIEW

Pay-to-win loot boxes are a form of microtransaction in video games, offering purchasable in-game content that contains a variety of rewards, typically items that enhance a player's resources or abilities. In this chapter we will take a brief look into the history of microtransactions, loot boxes and pay-to-win in video games. After introducing the backgrounds of the topics regarding this research, we will review some of the existing research and literature on the topic of pay-to-win microtransactions and loot boxes. Finally, we will conclude this chapter with a brief discussion of our findings and the limitations regarding the topic.

2.1 History of microtransactions

Let us first explore the concepts of microtransactions and their introduction into the world of gaming. The topic of microtransactions has gotten a lot of attention in the field of research, particularly due to their involvement in recent controversies concerning their legality and ethical implications. Critics argue that this monetization model closely resembles gambling activities, raising ethical concerns about its inclusion in video games accessible to children. [5]

Microtransactions refer to small payments made within a video game, forming a business model where virtual goods are sold in-game. These virtual goods come in various forms, and modern video games feature a wide array of implementation strategies. We will delve into some of these implementations after briefly exploring the history of microtransactions. This monetization model dates back to the 1990s, originating from arcade machines where players inserted coins to access games to either get more lives or playtime. [7] Transitioning from arcade machines to digital games, the sale of virtual goods was successfully implemented within Massively Multiplayer Online Role-Playing Games (MMORPGs) in the late 1990s and early 2000s, in titles like *EverQuest* (1999) and *MapleStory* (2003) spearheading this trend. The commercial trade of virtual goods continued to thrive with the emergence of free online social gaming platforms such as *Habbo Hotel* (2001) and *Second Life* (2003). The concept, which is now known as microtransactions, gained even broader public recognition

on the social media platform Facebook, which launched in 2004, through its add-on applications. These applications included social and casual games like *Farmville* (2009), which featured microtransactions such as removing gameplay limiters, and were more accessible to a wider audience due to their free-to-play nature compared to MMORPGs. [4] During the 2010s, the market for microtransactions experienced exponential growth, becoming a dominant revenue model in the gaming industry. In the year 2020, it was estimated that microtransactions accounted for over 70% of total generated revenue in video games. [5] The motivation for including microtransactions in video games is clear: they serve as an effective strategy for generating substantial revenue. By offering players the opportunity to purchase in-game items or enhancements, game developers can create additional revenue streams beyond initial game sales, thereby maximizing their financial returns.

A major incident that gained public attention and controversy regarding microtransactions involved pay-to-win monetization through loot boxes in the video game *Star Wars Battlefront II* (2017). [12] In its multiplayer mode, players could unlock characters and powerful items that would possibly enhance their chances of victory, which were only accessible through gameplay and loot boxes. Unlocking these characters by playing the game was considered incredibly difficult and time consuming and it created a gap between the players willing to spend money on the microtransactions and those who could not or were not willing to. The reception of this monetization model did not only raise huge criticism from the public, but also the Belgium government criticized EA for promoting gambling like activity to adolescents. Later on, EA made changes to the monetization model as a result of the controversy.

2.2 Loot boxes

Next let us explore the microtransactions labelled as loot boxes, a random reward system for obtaining in-game items. The concept of loot boxes involves a container, often visually portrayed as a crate, chest, or lockbox, offering the player a chance to win rewards from a table of loot items. This table categorizes the items into different rarity tiers, typically ranging from common to rare, and sometimes to even more rare categories such as legendary. As a result, highly desired items are rarely obtained, while basic items appear more frequently.

Additionally, the loot may be graded differently during seasonal events or promotions, featuring both new items and increased probabilities for certain rewards. This variation incentivizes players to spend during these limited-time periods to enhance their chances of acquiring exclusive content that may not be available outside of these events.

The loot items can take many different forms, a powerful weapon or an item, a cosmetic visual transformation of a character, or a new ability for the player to use in-game. These loot items are intended to enhance in-game aesthetics or assist the players in achieving different kinds of in-game objectives, and they are typically designed to encompass the video game's overall style.

The implementation of loot boxes varies in different games when it comes to functionality and looks. In collectible card games (CCGs) like *Hearthstone*, loot boxes take the form of card packs. The packs in *Hearthstone* contain five cards and can be obtained either by using the in-game currency "Coins" that are acquired from gameplay related challenges, in-game premium currency "Runestones" which can be bought with real money, or by using real money transactions directly. In some games such as *Counter-Strike 2,* the loot boxes appear in the form of a case and key pair, where the cases may be obtained via gameplay or events, but they still require a key to be opened, and the key is acquired via real money purchases from the Steam marketplace.

The pursuit for a desired item creates a cycle of opening loot boxes, which resembles gambling. This relation between loot boxes and gambling has been explored in recent research due to the availability of loot boxes in games accessible to children, but also their link to problem gambling as well as problem gaming. Researchers of this topic have discovered evidence on the connection of loot boxes and gambling: there is a clear distinction between non-problem gamblers and problem gamblers when it comes to spending money on loot boxes. [2][14] The same results were replicated among adolescents, where the amount of money spent on loot boxes would correlate to the severity of problem gambling. The relationship between problem gambling and loot box spending association would accumulate more than twice as much magnitude compared to adults in similar research. [16] With such concerning findings in regards to problematic behaviour among loot boxes, there have been attempts to ban loot box sales in video games, whilst unsuccessfully in Belgium, more regulatory attempts are still considered in many other countries in order to protect the consumers. [13]

The motivation behind loot box spending is part of the design, the psychological triggers from quick and easy one-click purchases encompasses impulse buying, exploiting the need for immediate satisfaction. It is also entangled in the feeling of success, as the rewards might help the player's progression or offer an in-game advantage, keeping the player hooked with the idea of better chances to continue on their path of victory. [1]

The prevalence of loot boxes in video games vary across different platforms. A 2020 study by Zendle et al. [15] discovered that the desktop platform Steam had 36% of the top-selling games containing loot boxes while the mobile platforms Android's Google Play Store having 58% and the iPhone's App Store having 59% of the top-selling games containing loot boxes. From the discovered games containing loot boxes, Steam had 38% of the games age rating suitable for ages of 12 and over, while the Google Play Store and iPhone App Store had the respective percentages at a concerningly high 93% and 94%.

2.3 Pay-to-win

We explored the motivation of loot boxes in the last paragraph, and its association to winning or avoiding losses by gaining an advantage via real money purchases. This is considered pay-to-win in video games. Pay-to-win is not limited to only loot boxes and can be considered as its own section in microtransactions, where some of the rewards are cosmetics that change the looks of a character, while others provide some sort of gameplay advantage in the video game. For example, the advantage can be a powerful in-game item, a method of skipping gameplay limiters such as a timed resource recharge, or a method of faster progression such as season passes or levelling up a character.

Pay-to-win monetization often offers the gameplay advantage by providing the player with better chances of victory, but not necessarily a guaranteed one.

- In the CCG *Hearthstone* the advantage comes from faster progression; the player can improve their collection of cards quicker if they choose to spend real money on card packs. This does not mean the player will win every time, even if it enhances their chance of victory by having more choices and pieces for constructing a statistically stronger deck in regular gameplay.

- In the mobile game *Raid: Shadow Legends,* the players can purchase resources that can be used to skip timers, which is a form of a gameplay limiter for to the dungeon runs, allowing them to farm items and levels much more rapidly.
- In the MMORPG *Black Desert,* the real money store contains in-game items, costumes that provide characters statistics increases, therefore providing a direct advantage for the purchaser.

As we can see from these examples, the genre of a game is not a limiter for pay-to-win microtransactions.

Pay-to-win monetization of video games raises concerns in competitive gaming as it used to be all about skill, patience and determination, the inclusion of pay-to-win microtransactions changes the aspect from these traits towards money talks. [13] The requirement for being competitive shifts towards those willing and capable of spending enough money to reach the best possible circumstances for victory, which takes away from the gaming experience of getting good.

2.4 Previous research

This section reviews existing research on pay-to-win loot boxes and their impact on player experience, specifically addressing studies on either loot boxes or pay-to-win microtransactions. Research that explicitly combines these two elements is limited apart from a few exceptions. Studies on loot boxes frequently explore issues related to gambling, ethics, and legality. Although, this review focuses on player perceptions and the fairness of these microtransactions and examining how they affect gameplay, we will also take a note of some issues related to gambling as well as explore issues related to the ethicality and transparency of the in-game purchases, from which the latter would include players' perceptions regarding the implementation of these monetization methods.

Freeman et al. [3] study conducted with sports games such as *FIFA, NHL,* and *Madden NFL* and card games such as *Hearthstone* and *Magic: The Gathering Arena* indicates that there is a mixed reception towards the fairness of pay-to-win microtransactions in competitive games. Some participants thought that the in-game purchases were outright unfair and unethical, but others thought that as long as the game was balanced and there was an equal chance to win

regardless of purchases, the microtransactions were fair. The study also suggests that there is a relation between enjoyment and the perception of fairness of these pay-to-win elements, if the player sees the purchases as fair, they will more likely enjoy the game. This study provides valuable insights into the perception of fairness in pay-to-win video games, highlighting diverse viewpoints both supporting and opposing these mechanisms. By examining these perspectives, the study elucidates the complexities of fairness as perceived by different stakeholders in the gaming community.

Zhang & Liu [17] conducted a study investigating the motivations for pay-to-win purchases among Chinese players in the game *Diablo Immortal.* Their research discovered 5 influencers on buying microtransactions; first was social value followed by conditional, emotional, functional, and monetary values. The findings indicate that the importance of social aspects like social groups within the game as well as the friendships among the players would encourage the spending of real money for virtual goods. Regarding the functional value, most of the participants did not consider the pay-to-win aspects of the game unfair, but they did recognize the competitive advantage this type of microtransactions have when it comes to the player-versus-player gameplay. These findings would complement the perceived fairness found in the Freeman et al. [3] study, although the limitation in this study is the small sample size of participants.

Howard [6] identifies that the status and identity of a gamer is tied to their success in a game. Using *Hearthstone* in a case study of his research, Howard argues that free-to-play games encourage players to take the step up from a negatively portrayed casual gamer to a hardcore gamer by spending money on the microtransactions that provide an advantage in gameplay. This study takes a deeper look into the video game *Hearthstone,* although the game has received major updates regarding the in-game currency acquisition, as well as the social aspects of gamers' status when it comes to player-versus-player games with microtransactions. His research also complements the study conducted by Zhang & Liu [17], which indicates that the social value was rated as the highest influencer in pay-to-win purchases.

Lemmens [9] inspects the significance of pay-to-win loot boxes' effect on gameplay in the game mode *FIFA Ultimate Team 21*. The study did not find a statistical significance regarding players spending real money towards the in-game purchases. While it did have a slight impact on the competitive success, the main factor remained the time spent playing the

game. They also found a relation between sensitivity to rewards and the loot box purchases. This study had a slightly different approach than the previously reviewed studies, but it raises an interesting point regarding the sensitivity to loot box rewards, which they stated to be related to gaming disorder.

Macey & Bujić [10] conducted an analysis regarding perspectives on loot boxes in the *Overwatch* community, using a wide variety of discussion forums for data collection. Their findings differ from the other reviewed research, as the participants were more negative towards the pay-to-win loot boxes, finding them highly problematic in competitive games due to their impact on games balance. The study also proposed a solution regarding the issues of gamblification in video games and suggested that the industry would benefit from adopting frameworks similar to what is used in responsible gambling initiatives rather than trying to create a legislative regulation.

King & Delfabbro [8] explore social responsibility measures regarding microtransactions in their research from four different areas of measurement: game design and in-game purchasing system characteristics, transparency and accuracy of game design features, broad consumer protection measures, and consumer information and industry accountability. Their study suggests for further research on the matter, but also calls for improved ethical standards regarding the monetization and transparency regarding the in-game presentation of purchases as well as regulatory aspects to be involved in the design and implementation of microtransactions in video games in order to discover more about these potentially predatory monetization methods.

Petrovskaya & Zendle [11] research explores the predatory monetization aspects in video games, also complementing the King & Delfabbro [8] study findings with a more in-depth view. The study discovered thirty-five different monetization techniques which the research participants would consider problematic, either seen as unfair, misleading, or aggressive. These monetization techniques were divided into eight domains: game dynamics designed to drive spending, product not meeting expectations, monetisation of basic quality of life, predatory advertising, in-game currency, pay-to-win, general presence of microtransactions and other. Their research found a wide range of monetization techniques the participants consider problematic and suggests that improved regulation and transparency regarding the in-game purchases should be considered, similarly to other research papers we have reviewed in this section.

2.5 Conclusion

Unfortunately, the literature regarding pay-to-win loot boxes specifically is limited. We were able to discover differing results within the scope of pay-to-win, microtransactions, and loot boxes. We were able to review research that touched on the topics of players perceptions, fairness, and the gameplay impact of these microtransactions, but we also found out the importance of social aspects when it comes to monetization of video games.

While the explored literature was not specifically focusing on players perceptions towards pay-to-win loot boxes, we managed to make some observations regarding the topic in question. We discovered mixed opinions regarding the fairness of these microtransactions, some would consider them fair on the basis of having an equal chance of victory regardless of purchases, while others would see them as highly problematic in competitive gameplay due to the advantage they might provide. The other issue discovered in the previous literature we explored was the relationship between loot boxes and gambling, as well as their association with gaming and gambling disorders.

In regards to the social aspects of pay-to-win microtransactions, we discovered that friendships, and in-game social groups, may have an effect on encouraging players to spend money on virtual goods. Another encouraging factor towards making pay-to-win purchases was considered to be the social status of a gamer, as the gameplay advantage provided by the microtransactions were considered to have a high impact on the players success in player-versus-player environment, and the so-called casual gamers were portrayed negatively on social platforms.

The literature we reviewed also highlights the need for further investigation into the predatory aspects of microtransactions. Research has identified several problematic monetization techniques that may be considered as unfair, misleading, or aggressive. As suggested by these studies, such methods warrant deeper examination and possibly improved regulation. Additionally, there is a call for greater transparency in in-game purchases from both design and development perspectives, as some methods were perceived as misleading by players and research participants in the studies we explored.

Overall, the topic of pay-to-win microtransactions has mostly received a negative reception among gamers when it comes to previous literature on the topic with the main concerns being the impact on competitive gameplay, and the advantage they can provide to those willing and able to make such purchases, but also the transparency of the monetization method.

3 METHODOLOGY

In this chapter, we detail the research methods employed in this thesis, beginning with the data collection process using questionnaires specifically designed for this study. We then examine the role and purpose of the demo game within our research framework, highlighting its goals for the questionnaires. Following this, we discuss the data analysis approach, emphasizing the mixed-methods analysis used to derive both quantitative and qualitative insights. Finally, we conclude by summarizing the parts of this chapter and briefly discussing a discovered limitation related to the implementation.

3.1 Data collection

The purpose of this research is to explore the players' experiences and perceptions regarding pay-to-win loot boxes. To achieve this, a demo game was developed and tailored specifically for the purpose of this research, along with two surveys, a pre-gameplay questionnaire and a post-gameplay questionnaire. The use of a tailored game for demonstration purposes suits the topic fairly well, with some limitations being in the implementation of the game due to time constraints, as there is only so much that can be achieved within time limits by a single developer. To accompany this game, and for the purpose of data collection, the questionnaires were a fitting solution providing an easy method for the participants to answer. Although the game was designed to be downloaded by participants, concerns about sharing resources online may have discouraged some potential participants. While this is speculative, the discrepancy between the number of forum post views about this research and the actual number of questionnaire respondents suggests that certain factors limited participation.

The pre-gameplay questionnaire covered several areas, including demographics, gaming habits, experiences with pay-to-win microtransactions, perceptions of pay-to-win loot boxes, and expectations and attitudes. It comprised both multiple-choice and open-ended questions. The primary goal of this questionnaire was to gather information about the participants' backgrounds such as age, gender, and gaming habits as well as their previous experiences and perceptions related to microtransactions and pay-to-win loot boxes. Additionally, it aimed to understand the participants' expectations and attitudes toward spending money on this

monetization model. Overall, the pre-gameplay questionnaire sought to establish a contextual foundation for understanding the participants' backgrounds and experiences related to the research topic.

The post-gameplay questionnaire focused on several key areas related to the demo game, including immediate gameplay feedback, perceptions of pay-to-win loot boxes post-gameplay, a comparison of initial expectations with actual experience, future engagement and behavioural intent, and open-ended feedback. It included both multiple-choice and open-ended questions. The primary goal of this questionnaire was to gather information about the participants' experiences with the demo game and their reflections on the pay-to-win loot box simulation. Additionally, it aimed to assess any changes in the participants' opinions on the research topic following gameplay. Finally, the participants were provided an opportunity to offer feedback on the demo game. Overall, the post-gameplay questionnaire aimed to identify shifts in the participants' opinions concerning the research topic and to explore any changes in their perceptions of fairness.

3.2 Demo game goals

The primary objective of the demo game in this research is to illustrate the implementation of pay-to-win loot boxes and simulate the experience of them to the participants. Although the demo is free-to-play and players are provided with free keys to unlock cases, the intent is to effectively showcase the impact such microtransactions have on gameplay experience. A secondary objective is to explore the perceived fairness of loot boxes and how obtaining specific items from a pool of randomized rewards can shape players' perceptions of the game. The goal for this demo aims to provide insights into how these monetization strategies influence player experiences and attitudes as well as their impact on the gameplay. In the next chapter, we will dive deeper into the implementation of the demo game, providing more detailed insights into various aspects of the game, including the mechanics of the gameplay and the loot boxes.

3.3 Data analysis

For the analysis of the data, mixed-methods analysis was used. This approach was chosen to incorporate both quantitative data from multiple-choice questions and qualitative insights from open-ended follow-up questions. Additionally, standalone open-ended questions were included to gather qualitative data, allowing for a deeper exploration of meaningful insights related to the research topic. The data was collected using Google Forms, which allows for direct examination of questionnaire responses within the Forms service or their transfer to Google Sheets to create additional charts from the dataset. Both services were utilized for data analysis.

The first phase of data analysis involved familiarizing ourselves with the collected questionnaire data to identify themes relevant to the research question. This process aids the researcher in becoming acquainted with the data and provides insights that inform the later phases of analysis.

The second phase of data analysis involves using these themes to identify relevant quantitative data, aiming to determine if there is any statistical significance or relationship in the dataset. This phase establishes a connection between the background and the gaming habits in relation to the participants' opinions and experiences with the microtransactions.

The third phase of data analysis builds on these quantitatively established connections by examining qualitative data. This involves analyzing open-ended responses to uncover additional insights and reasoning behind participants' answers.

The fourth phase of data analysis is to utilize the qualitative data in an attempt to explain the findings along with the quantitative data. By doing so, we aim to highlight specific aspects that contribute to participants' perceptions of these microtransactions.

We will then highlight key findings relevant to the research in the discussion chapter and draw final conclusions from the data collection and questionnaire responses.

3.4 Conclusion

In this chapter, we explored the research methodology, discussing data collection methods through two questionnaires and examining the objectives of the demo game in relation to these surveys. We also reviewed the mixed-methods analysis employed, combining quantitative and qualitative approaches to derive deeper insights from the participants' responses beyond mere statistical data. However, the study faced limitations due to a low number of participants, which impacts the dataset's accuracy. This limitation is speculated to arise from the demo game's implementation, as participation required downloading game files from an online resource, which may have raised concerns among potential participants. The number of participants could have been higher if the game had been available to play in a browser instead of requiring a download.

4 DEMO GAME

In this chapter, we examine the demo game designed to simulate the pay-to-win loot box experience common in video games. As detailed in the methodology chapter, this demo game was developed to provide participants with an illustrative experience for the questionnaire, showcasing the distinctive characteristics and effects of random rewards on the gaming experience. While its primary purpose is to demonstrate pay-to-win microtransactions, incorporating real money transactions was deemed unethical, as it would require participants to spend their own money. Consequently, the demo game simulates this experience by allowing players to open loot boxes with keys earned through gameplay, potentially enhancing their in-game abilities.

Firstly, we explore the design choices that guided the development of the game, examining the conceptual and technical considerations involved. Next, we delve into the implementation of gameplay elements, highlighting how these were crafted to engage players and provide an authentic user experience. Following this, we detail the implementation of the loot boxes, focusing on how these features were integrated to closely mimic real-world pay-to-win dynamics. Lastly, we offer a summary that encapsulates the key findings and observations, illustrating how they contribute to our broader research goals.

4.1 Game design

The first design choice for this project was to identify a solution that would complement the survey of this research. While the options were somewhat limited, it became apparent that using the game alongside a pre-gameplay and a post-gameplay questionnaire would be a good choice, as the goal was to inquire players' opinions and experiences regarding the pay-to-win loot boxes. The game would work as an introduction to loot boxes and their randomness for those without previous experiences, and as a showcase for those with knowledge on the topic.

The second design choice was the type of game that could support the usage of pay-to-win loot boxes, as the rewards from the loot pool would have to be meaningful within the game,

and they needed to have an impact on the gameplay experience. There was also the aspect of personal preference when choosing the type of game to be used, but the implementation of pay-to-win items for a shooter game works well as a concept. Incorporating a survival aspect into the game increases the importance of using these items to achieve the best experience and the best results, as the goal for the game is to survive for as long as possible while defeating the opposing forces.

The third design choice would come down to the game engine used in development, and for this project, picking Unity was the easiest option, as the game engine has broad documentation, large community, and great selection of assets available in the Unity Asset Store. Another factor here was previous experience using the game engine which would make the development process come somewhat more naturally, as well as the features within the game to be more advanced compared to starting the project without previous knowledge of the game engine.

4.2 Overview of the gameplay

The gameplay perspective of this demo game is top-down with 3D graphics, and the genres of the game are shooter and survival (see Figure 1). The 3D models and environment are bought from Unity Asset Store, and are made by Synty Studios. The game audio constructs of suspenseful background music, with sound effects for opening the loot boxes and the scream of arriving zombie waves. Each of the audio elements are free for use from Pixabay. The user interface (UI) of the game informs the player about their progress, the players health, and the players roll ability cooldown recharge time. The UI also gives players good-to-know messages regarding the gameplay and events that are happening in the game.

The story of the game sets the player on an abandoned island with some destroyed and damaged buildings and machinery. The player is sent to the island in order to recover some intelligence on what has happened there, but the main character is suddenly ambushed by a horde of undead zombies. This is where the gameplay starts, and the players main goal is to survive for as long as possible by defeating their enemies. As a wave of enemies is defeated, the player recovers some lost health points, and a new round of enemies begin to approach. Each round of enemies defeated, the number of zombies grows. This main challenge has no

ending, as the horde of enemies is endless, although every third survived round the player is awarded a key for the loot boxes.

Figure 1. Gameplay of the player being chased by enemies.

The secondary challenge of the game is to defeat as many enemies as possible, while this has no real effect on the progression of the game, it is a personal challenge within, where the player challenges themself, fighting for the new best highscore. The score is tracked based on rounds survived and enemies defeated, and this is displayed at the end of a game session, or at the main menu. The game also tracks the current game sessions progress displaying how many zombies have been defeated and what round number the player is currently at.

The third challenge for the game is to collect all of the available loot items in the game, which will be covered in the next subchapter, 4.3 Implementation of the loot boxes. By achieving this goal, the player can truly see the impact of receiving random items compared to the ability of picking and choosing.

4.3 Implementation of the loot boxes

The players begin the game equipped with a default character skin with a basic pistol as their weapon, without any skill-enhancing items available to use. Following the conclusion of the first and initial game session, in which the player is defeated for the first time, they are awarded a set of 10 free keys for opening the loot boxes. Additional keys after this are earned for every three rounds survived. This design decision underscores the purpose of the demo game, which is purely to illustrate the mechanics of pay-to-win loot boxes without necessitating real money transactions. This approach maintains an ethical framework by ensuring participants are not financially burdened, thus allowing the focus to remain on the educational and research objectives of the study.

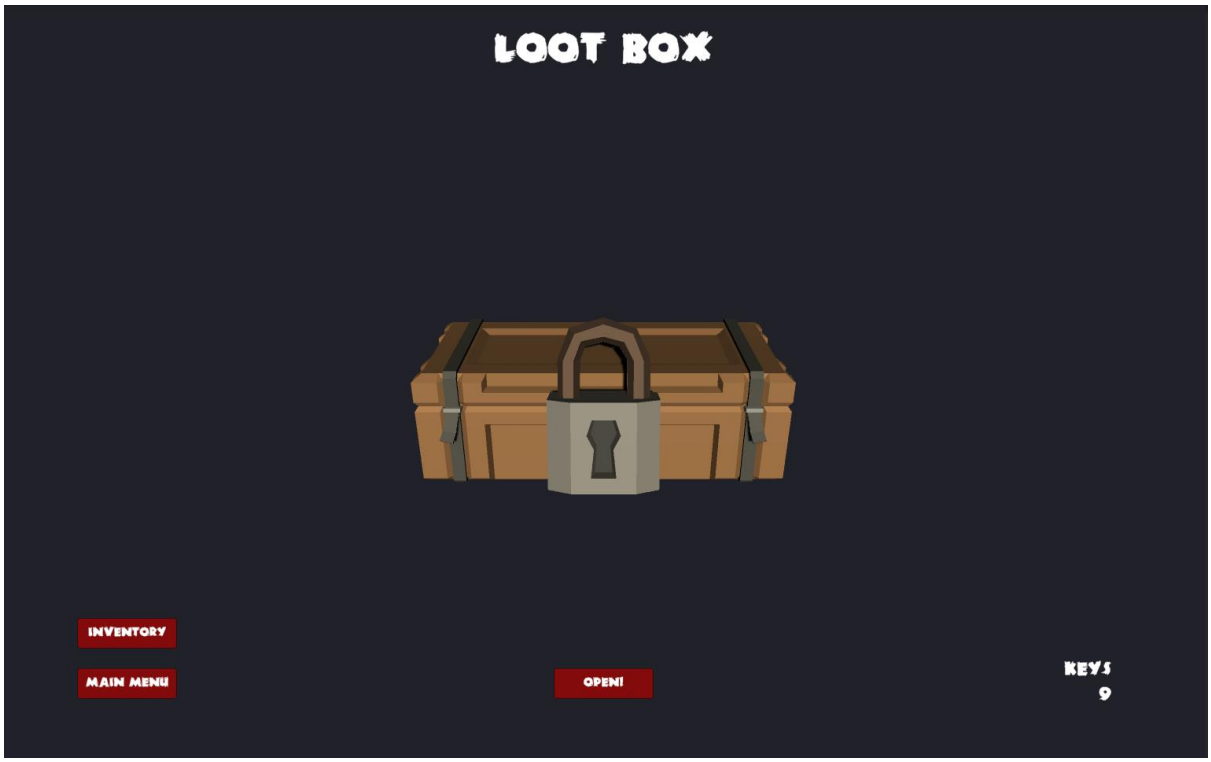

Figure 2. Loot boxes require keys to open.

Loot boxes are implemented as their own scene, where the player can click a button to open the loot box (see Figure 2), which will then award the player with a random reward item from the loot pool. Each time the player opens the loot box, one key is deducted from their storage. If the player does not have keys, they will be informed about it in the user interface. Also, if

the player has gotten all the possible loot already, the player will be informed, and the loot box will be unavailable to open from there on.

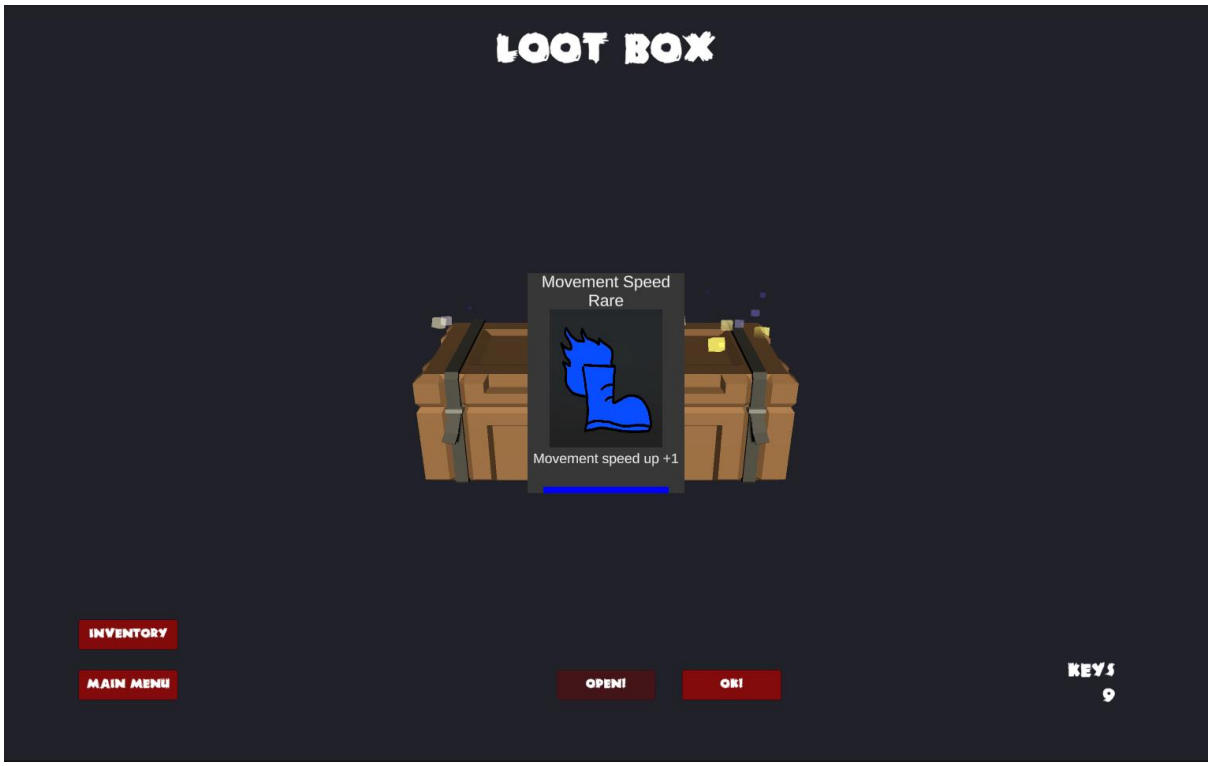

Figure 3. Loot boxes award the player loot items.

The loot is graded by rarity tiers, going from common to legendary. Common items are the only cosmetic items and Weapon items include three additional guns. Rare, Epic, and Legendary items boost the characters abilities such as the roll cooldown, maximum health, amount of health recovered, weapon fire rate, and weapon damage. Each of the rarity tiers have a different probability, and all of the abilities have variants across their respective rarity tiers, with smaller probability rewards offering more powerful abilities. Each item is color-coded to correspond with its relative rarity tier in the loot table. For example, the reward shown in Figure 3 is blue, indicating it belongs to the Rare loot tier.

- **Common tier**: Color green, 30% rarity
- **Rare tier:** Color blue, 20% rarity
- **Epic tier:** Color purple, 15% rarity

- **Legendary tier:** Color orange, 10% rarity
- **Weapon tier:** Color black, 25% rarity

The rarities are set fairly equal for these loot boxes, as the purpose of the demo is to provide insight into the loot boxes functionality, rather than making it too demanding and time consuming for the participants to achieve some of the best available loot. Opening the loot box awards one item at a time, and the player will not get any duplicate items. After each item in a rarity tier has been awarded, the remaining rarity tiers are then re-calculated to match their respective percentages out of 100%.

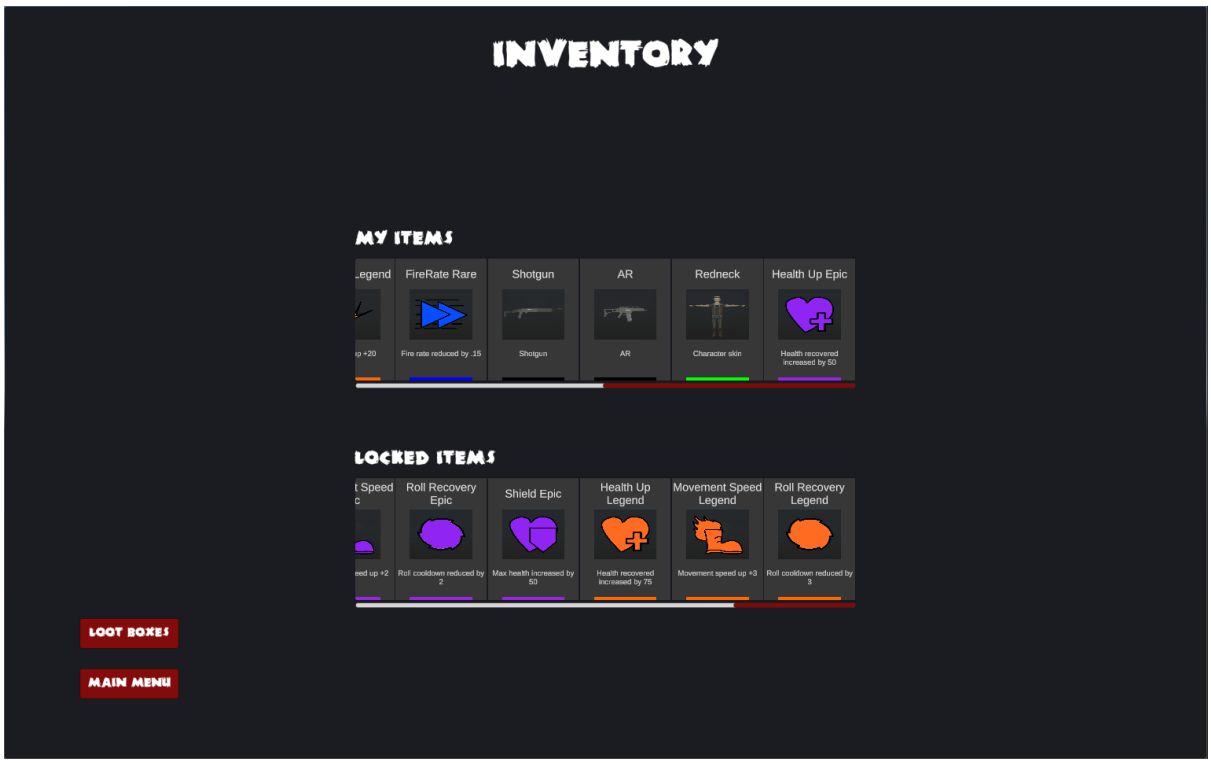

Figure 4. Inventory showcases the players items and the locked items.

The inventory scene displays the player's current items as well as all the items available on the loot pool that the player has not yet received (see Figure 4). The loot system is managed using JSON files and a read/write script. The awarded items will be written onto a JSON file containing data such as the number of keys the player has, whether the player has received their initial 10-key reward from playing for the first time, and a list containing the names of the awarded items the player has received from the loot boxes. The script compares this list of awarded items to a list of all in-game items, creating a new list of available items by

picking items that are not matching between the two lists. This list of available items is then used when the player opens a loot box to ensure no duplicate items are awarded.

In the loadout scene, the player can select between different cosmetic items, weapons, and three skill items that they have obtained through the loot boxes (see Figure 5). The items from the players inventory will be displayed here as well, and this is where the player can decide which items they want to use in the upcoming gameplay session.

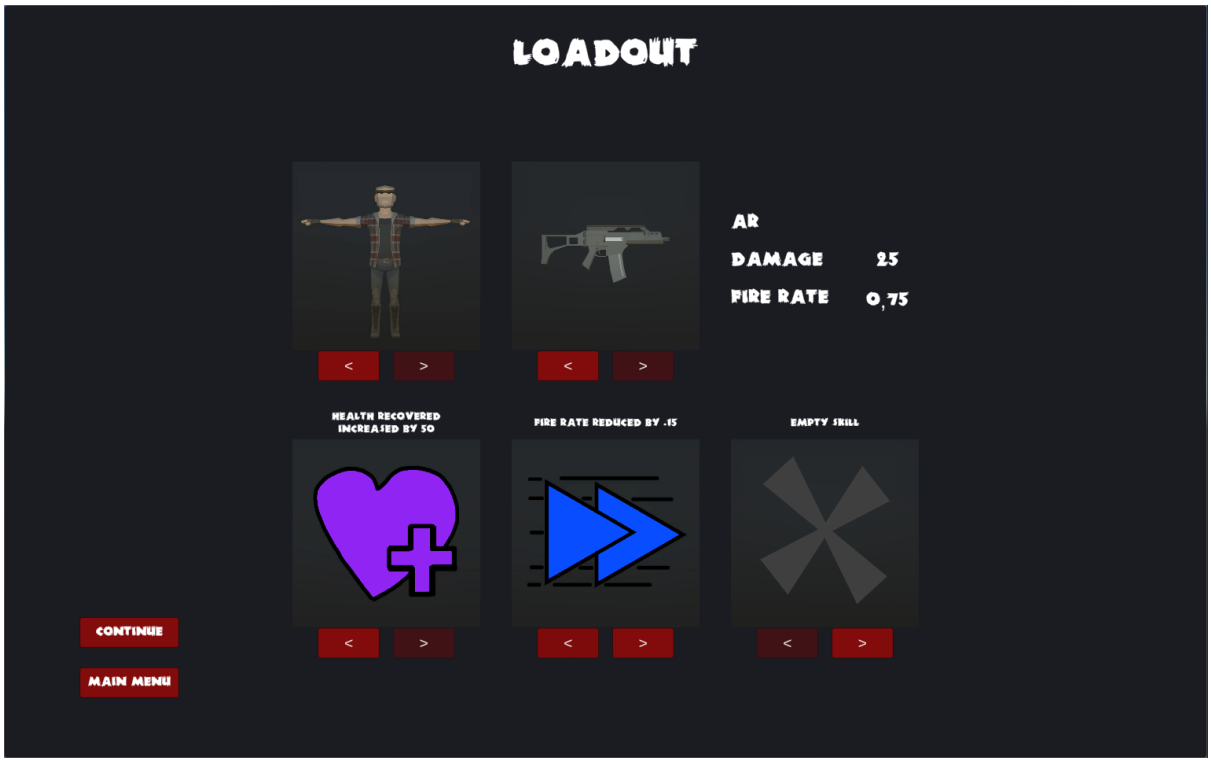

Figure 5. Equipped items can improve the player's ability to survive.

The cosmetic items have no effect on the gameplay, but the chosen weapon and skill items will have an impact on how the character will deal damage, have more hit points, recover more health between rounds, use roll skill more often, or move at an increased speed. The limitation in picking the skills is that there must be only one-of-a-kind skill selected, or the player can not start a game. The chosen skills can have the same effect only if it is from a different rarity tier.

4.4 Conclusion

In this chapter, we have demonstrated how the purposeful design choices and the implementation of both gameplay and loot boxes offer a comprehensive portrayal of the pay-to-win loot box dynamics in video games. By utilizing loot items to enhance player abilities, we effectively showcased the potential advantages that pay-to-win microtransactions would provide. The incorporation of a randomized reward mechanism highlighted the variable nature of such systems, illustrating their perceived fairness or unfairness depending on luck. By providing players with free keys to access loot boxes, we ensured that the demonstration remained ethical and suitable for research purposes, while still showcasing the impact on the gameplay experience.

5 RESULTS

In this chapter, we examine the results of the questionnaires and mixed-methods analysis to determine whether our findings address the research question concerning the players' perceptions of pay-to-win loot boxes and their impact on the gameplay experience. We will start by reviewing the participants' backgrounds and gaming habits before moving on to the quantitative data related to their perceptions of microtransactions. Then we will explore the qualitative data gathered from open-ended questions as well as its relation to the quantitative data.

5.1 Quantitative data

To begin this analysis, we will investigate the background of the participants for this research. The final number of accepted respondents were 17 out of 18 participants, as one of the responders had only participated in the pre-gameplay questionnaire. The questionnaires and the demo game were posted on a gaming related forum as well as some private gaming group channels.

The first question addressed participant's age. Participants' ages ranged from under 20 to under 40 years of age, with the most participants being in the age range of 30–34-year-olds. As per Figure 6, we can observe two main age groups, those of under 30-years-old with 8 of the respondents, and those above 30-years-old with 9 of the respondents. We can use these two age groups to try and discover any meaningful differences on their experiences and expectations towards pay-to-win microtransactions.

The second question was the participant's gender. The responses included 14 male and 3 female participants, resulting in an imbalance that limits the reliability of gender-related statistical analysis. Nevertheless, we can still explore their experiences and expectations toward pay-to-win microtransactions and see if we can find some differences when it comes to gender, despite this disparity.

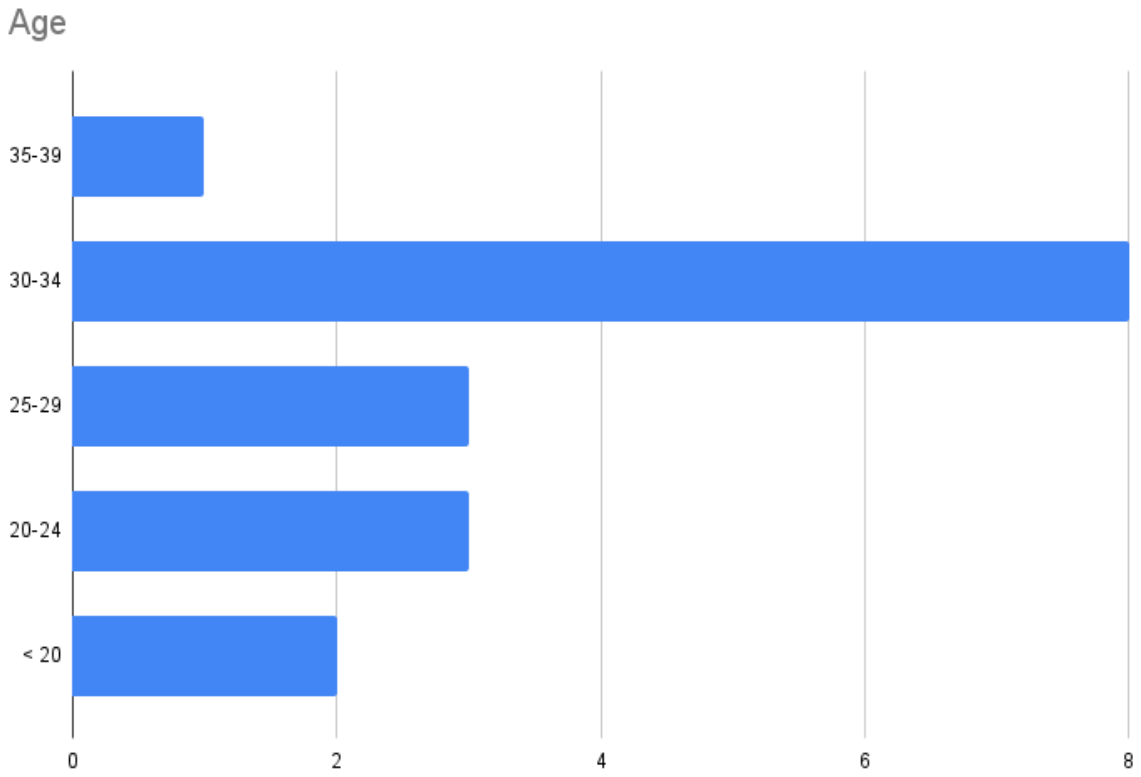

Figure 6. Participants age variance.

The third question was regarding the participants' gaming habits, asking how often they play video games. Most respondents reported playing video games daily, with a smaller group playing almost daily, and only a few gaming a few times a week or less (see Figure 7). We can use the participants' gaming habits in order to discover any meaningful differences in gaming frequency and experiences as well as expectations towards pay-to-win microtransactions.

The questionnaire also inquired about the participants' preference towards single-player, multiplayer, or both types of games. The majority indicated that they typically play both, while three reported playing only single-player games, and none exclusively reported to play multiplayer, creating an imbalance that limits the reliability of the statistical analysis concerning multiplayer gaming. In hindsight, this question could have resulted in better variance had there not been an option for picking both and thus forcing the participants to choose between the two instead.

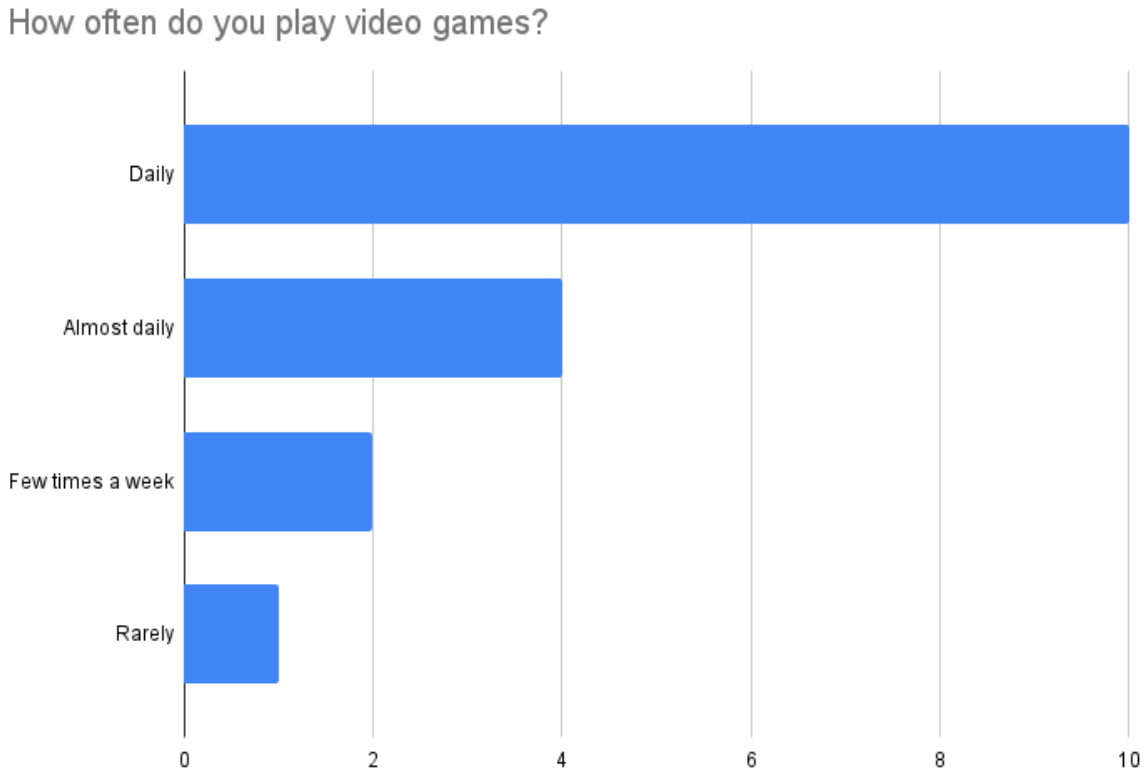

Figure 7. Participants' reported gaming frequency

The participants were also asked about their preferred genres of games (see Figure 8). There was a higher variety of interests among the responses, indicating that some of the participants do actually prefer multiplayer genres, such as the genre Multiplayer Online Battle Arena (MOBA), while others enjoy genres that fit both single-player and multiplayer categories depending on the game and mode, such as in shooter, fighting, and sports games. This question would also indicate that even though the participants have a preferred gaming genre, they might not play games exclusively of that genre. This could also explain why the single-player games were more popular among the respondents than multiplayer games, or the reason for some of the respondents opting to choose both rather than one of the two as their preferred type of game. However, this variation alone does not provide sufficient accuracy for in-depth analysis.

Among all the age groups, there were not any significant genres of games that would rise above others, nor did the age groups preference towards single-player games or multiplayer games had real significance. Between the two main age groups, defined as those from below 30-year-olds and above 30-year-olds, there were not any notable differences either. However,

the age group consisting of 30-34-year-olds had most variance with 5 different preferred genres as the second group of 25-29-year-olds had 3 different preferred genres, but this can be explained with the formerly mentioned being the largest age group in respondents of the questionnaire.

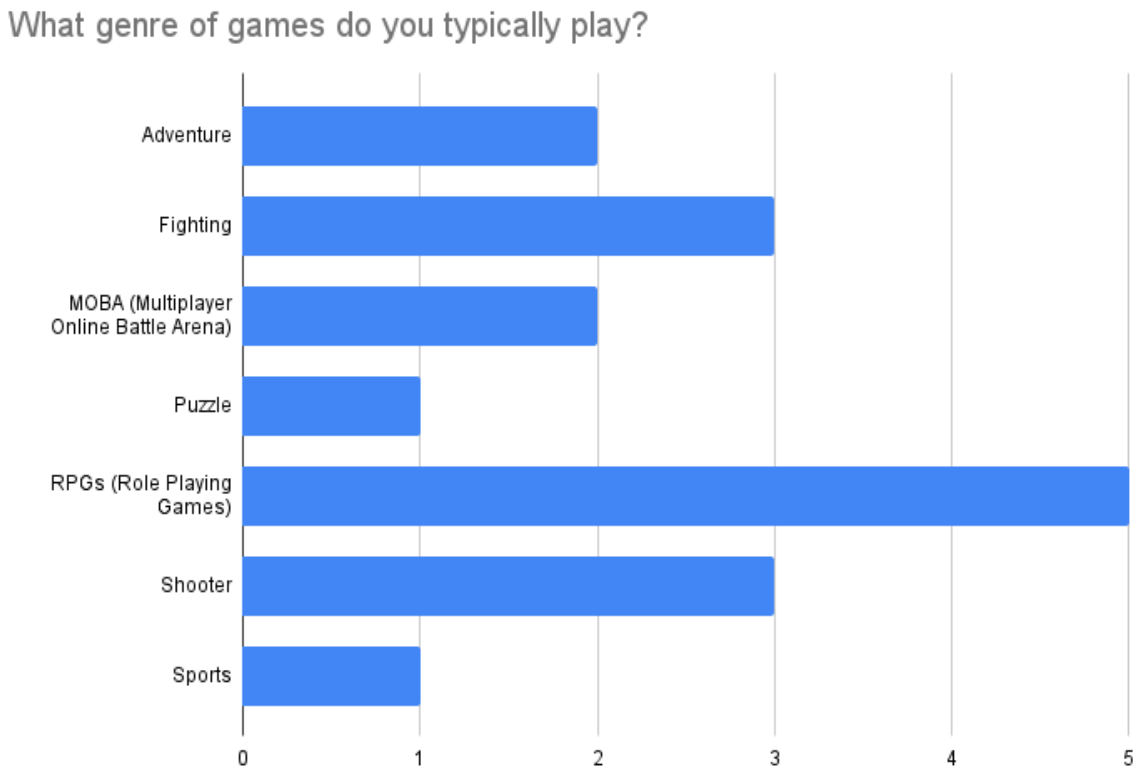

Figure 8. Participants' preferred genre of games.

Next, we move on to the question regarding participants' experiences with pay-to-win microtransactions, in which most of the respondents reported that they do not typically play games containing this type of monetization methods, with only 2 exceptions. However, with 7 participants, almost half of the total participants have purchased pay-to-win microtransactions previously, and out of those 7 participants, 3 had purchased pay-to-win loot boxes specifically.

We can now inspect the relation between respondents' gaming frequency and their participation in pay-to-win microtransactions for a better understanding whether the respondents' gaming background has any correlation towards their spending habits. Figure 9

illustrates this distribution of participants with and without previous microtransaction purchase experience in relation to their gaming frequency. We can see that the participants that have made previous purchases of pay-to-win microtransactions are more likely to play video games more frequently than those without a history of pay-to-win purchases. This outcome is anticipated, as individuals are more inclined to spend money on hobbies they engage in frequently.

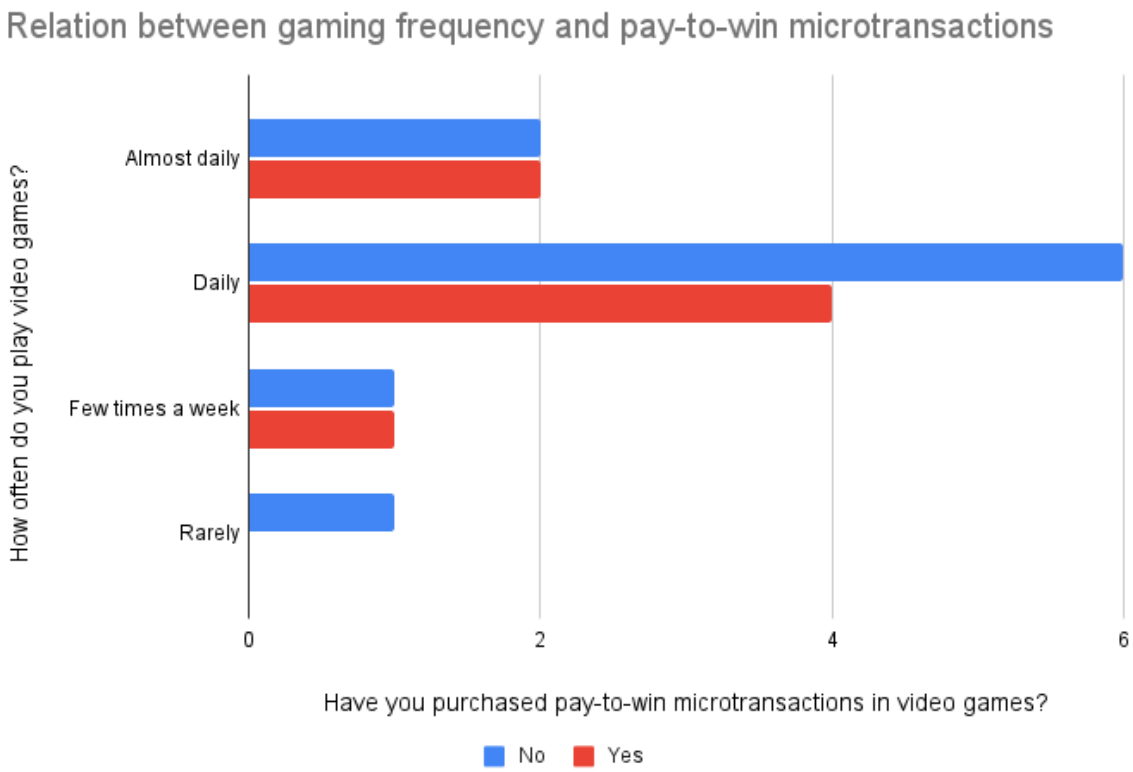

Figure 9. Relation between gaming frequency in comparison to participants' pay-to-win microtransaction purchases.

Considering the respondents ages in relation to pay-to-win microtransaction purchases, there is no significant indicator suggesting a difference in spending behaviour. Among those who had spent money, the age distribution was 3 participants below 30-years-old and 4 participants over 30-years-old. This minimal difference is not substantial enough to draw meaningful conclusions. Regarding participants' gender, 6 out of 14 male respondents and 1 out of 3 female respondents had a history of previous purchases. While the percentage of

male respondents with microtransaction purchases is higher, this statistic may be influenced by the larger sample size of male participants.

Then we move on to participants expectations and attitudes towards pay-to-win loot specifically, and in comparison to Figure 9, in Figure 10 we can inspect the relation between respondents pay-to-win microtransaction purchases and their general view of pay-to-win loot boxes from Likert-scale, where the scale is; 1 = Very negative, 5 = Very positive. 11 respondents had a very negative view towards pay-to-win loot boxes, 3 had negative view, 2 were in-between, and 1 had positive view.

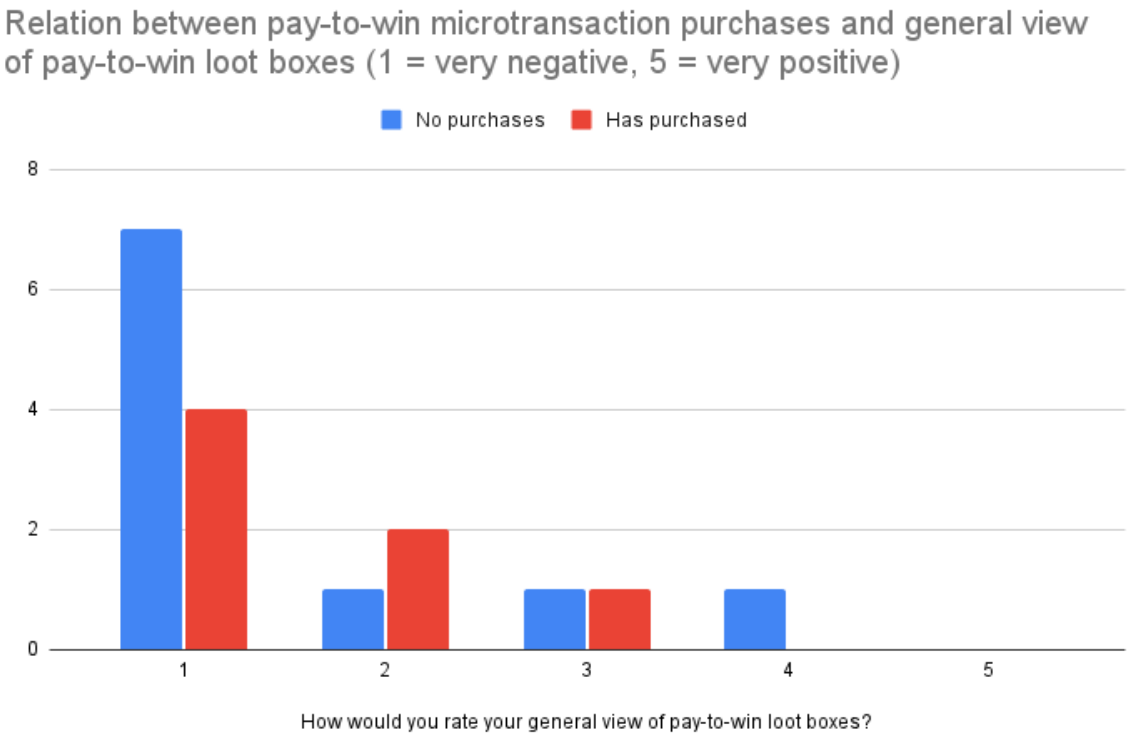

Figure 10. Relation between participants' pay-to-win microtransaction purchases and general view of pay-to-win loot boxes.

While the number of total respondents is quite low, the statistics would indicate that even though the general view towards pay-to-win loot boxes is mostly negative, the participants have made pay-to-win microtransactions regardless of that. Interestingly, the only respondent with a positive view of pay-to-win loot boxes had never made such purchase. In contrast, the three respondents who had bought pay-to-win loot boxes rated their perception as either negative or neutral. Although this observation might suggest dissatisfaction among those with

a history of purchasing these microtransactions, the small sample size prevents drawing any definitive conclusions.

We can also inspect the relation between participants age and their general view towards pay-to-win loot boxes. As per Figure 11, there is a slight difference between the two age groups of below 30-year-olds and above 30-year-olds, as the former would seem to have a more negative view towards this type of microtransactions.

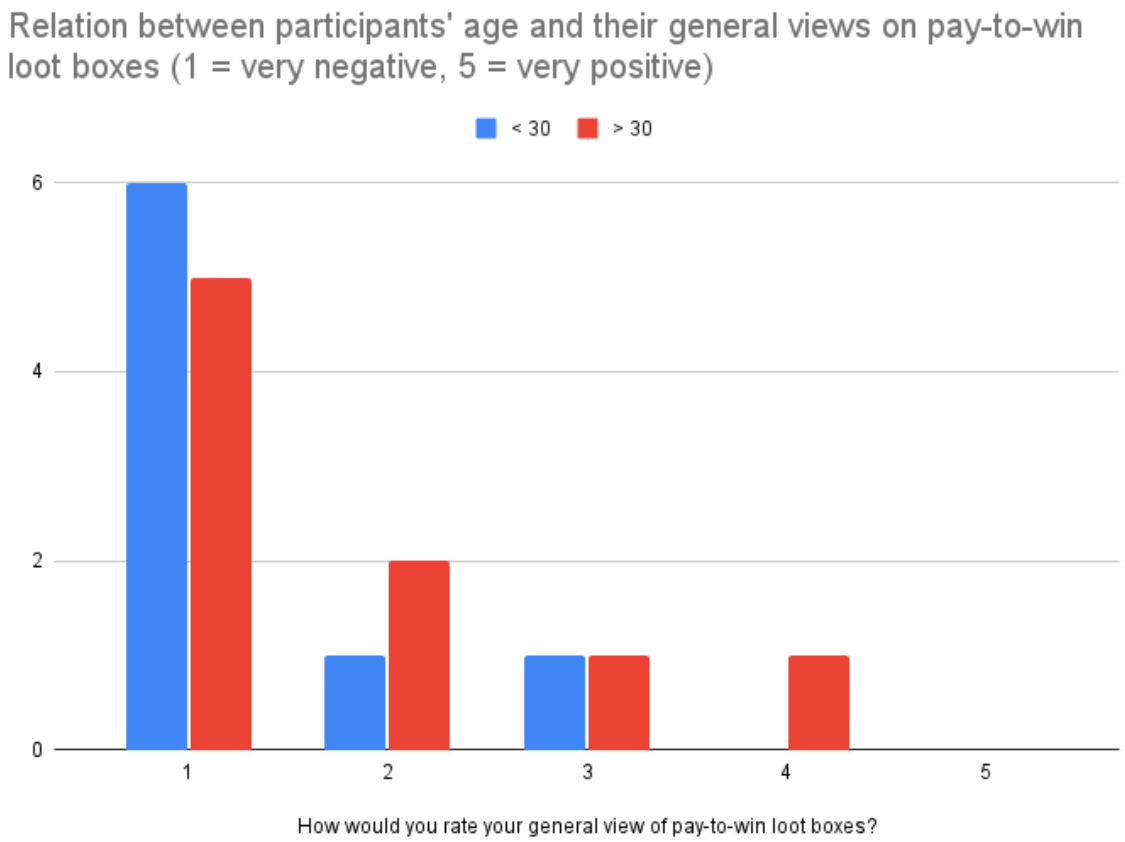

Figure 11. Relation between participants' age and their general views on pay-to-win loot boxes.

Even though the sample size of female participants was small, we can make a clear observation that their perceptions towards pay-to-win loot boxes in general are more positive in comparison to the male participants perspectives, who considered them to be mostly negative (see Figure 12). This could also be in relation to the gender's previous participation in pay-to-win microtransaction purchases, as there was only 1 female participant with prior

experience, which would indicate that those without previous experiences with this type of microtransactions would perceive them in a more positive light.

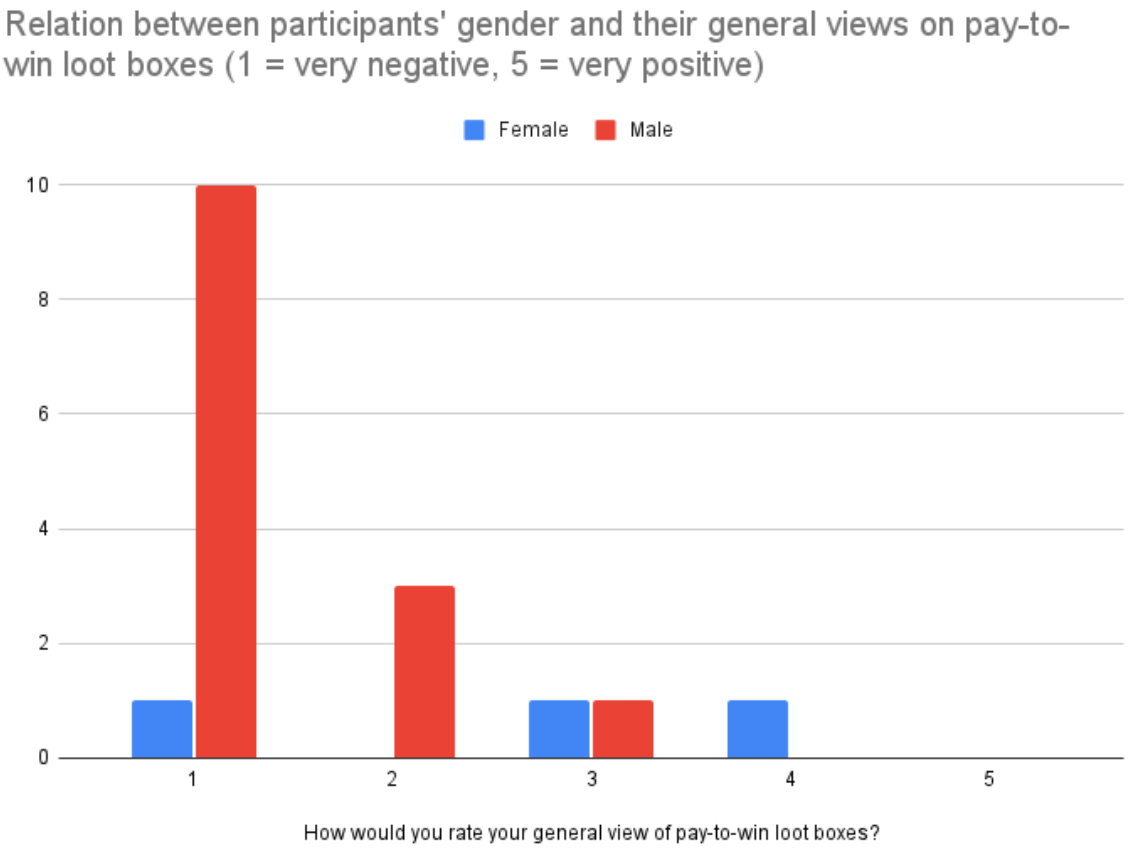

Figure 12. Relation between participants' gender and their general views on pay-to-win loot boxes.

Continuing with the expectations and attitudes, we can investigate the participants' opinions on the fairness of pay-to-win loot boxes for the purchaser regarding the randomness of loot that the purchaser might receive, 14 respondents viewed the randomness of loot to be not fair, while 3 thought it was fair.

Regarding the age or gender of the participants, there was no significant differences in the opinions towards the fairness of the pay-to-win loot boxes, with only 1 female participant and 2 male participants considering them fair, as well as 1 over 30-year-old and 2 under 30-year-olds with this opinion.

We can make another interesting insight towards the previous pay-to-win loot box purchases and the participants' history with pay-to-win microtransactions in general and see that everyone that had previously purchased them viewed pay-to-win loot box randomness unfair (see Figure 13). This would align with the argument we observed earlier that players with a history of purchasing pay-to-win loot boxes have dissatisfaction towards the randomness of the loot items.

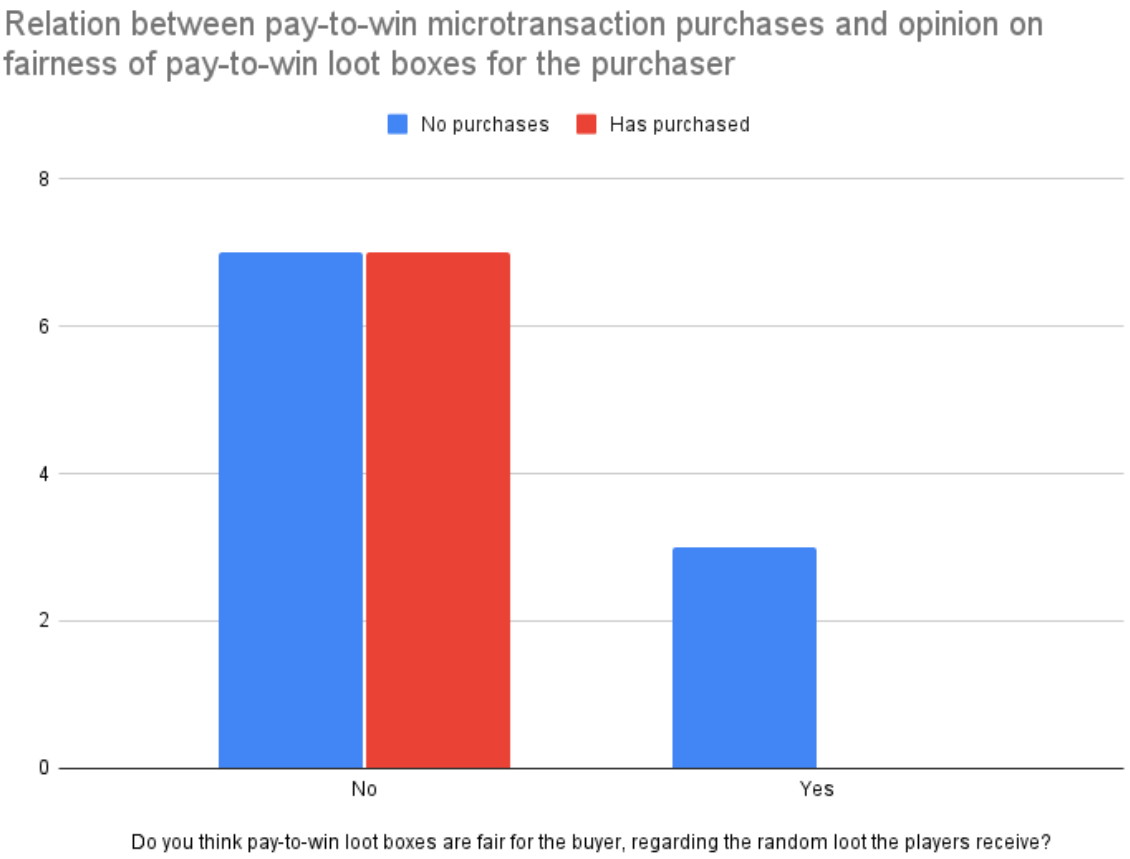

Figure 13. Relation between pay-to-win microtransaction purchases and opinion on fairness of pay-to-win loot boxes for the purchaser.

Regarding the respondents' opinions on pay-to-win loot boxes affecting the fairness of a video game, in which the loot would give a competitive advantage to the players that had spent money on the purchases, the participants mostly deemed them unfair with 14 against the 3 that did not consider them being unfair. We can see similar insights in Figure 14 towards this question as we explored in Figure 13 where we compared players' previous

purchases of pay-to-win microtransactions to the participants' opinion regarding the fairness of the loot box randomness.

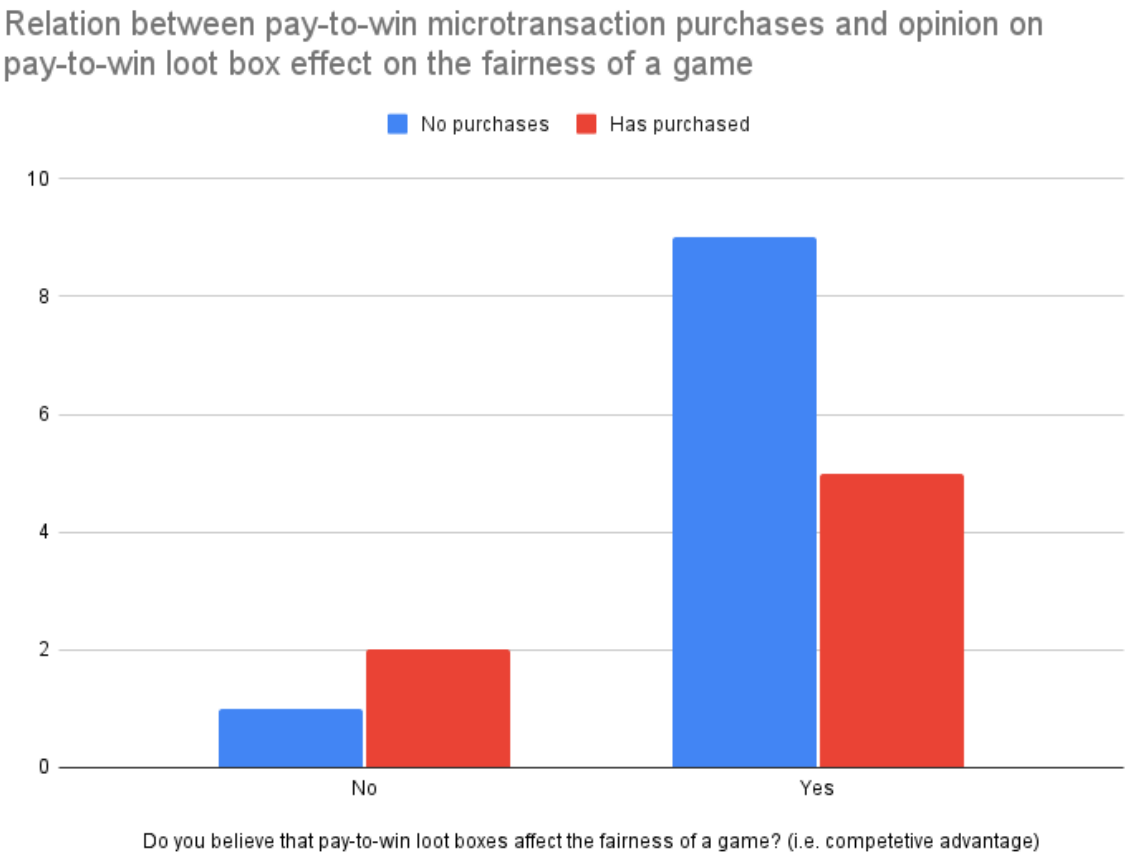

Figure 14. Relation between pay-to-win microtransaction purchases and opinion on pay-to-win loot box effect on the fairness of a game.

The question regarding competitive advantage provided by pay-to-win loot boxes had also interesting differences between the age groups of below 30-year-olds and above 30-year-olds, as everyone in the former agreed on the loot boxes being unfair, whereas the latter group had 3 out of 9 participants were considering the loot boxes being fair instead. And in the case of opinions based on gender, the female participants all viewed them unfair, while 3 out of 14 male participants considered them to be fair.

Post-gameplay the participants were asked if their gameplay strategy changed from the initial no-items-gameplay after they had received loot from the loot boxes. 13 participants reported that their strategy changed while 4 reportedly had no effect. The opinion on the fairness of

games with pay-to-win loot boxes on a Likert-scale was mostly less fair at 11 respondents, while 4 had no change in opinion, but 2 were on the more fair side. There might be a relation to this in the items received from the loot boxes as some of the items were purely cosmetic without any effect on gameplay, however we will explore more on that subject after going through the open-ended questions.

The demo game's implementation of pay-to-win loot boxes functionality was mostly as the respondents had expected, with 4 reportedly having different kinds of expectations of them. Most of the respondents reported that their opinion towards pay-to-win loot boxes had not changed, while 1 thought more positively, and 2 more negatively about them. Per Figure 15, we can see that respondents without previous purchases were the only ones that had changes in their opinion.

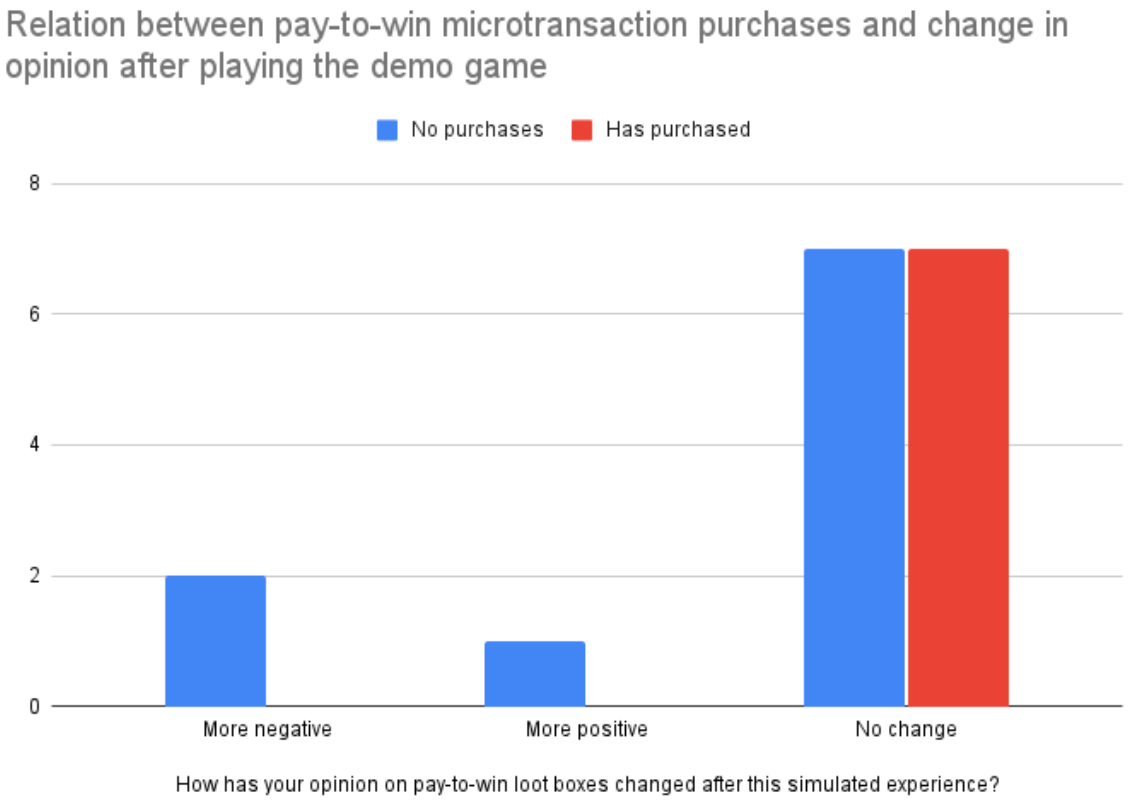

Figure 15. Relation between pay-to-win microtransaction purchases and change in opinion after playing the demo game.

Regarding the age in relation to changes in opinion towards pay-to-win loot boxes, both the changes for more positive or more negative were within the age range of 30-34-years-old. And when it came to gender, 1 female participant had a more positive view, while 2 male participants had more negative regarding these microtransactions. Overall, there does not seem to be any major statistical significance when it comes to these two points of views, as the clear majority had no changes in opinion. The actual reason for these changes in opinion would rather be explained by the participants gaming background, as the more positive opinion was from a respondent that plays video games every now and then, and one of the more negative opinions played few times a week, while the other in this category reportedly played daily.

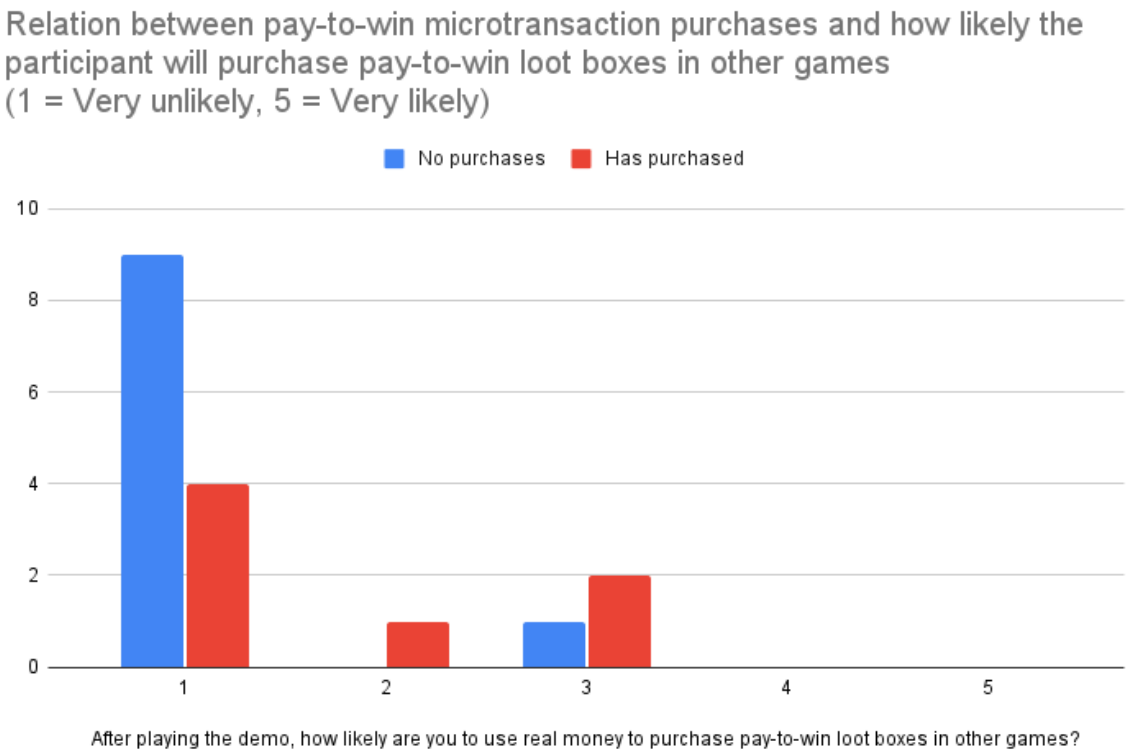

Figure 16. Relation between previous pay-to-win microtransaction purchases and how likely the participant will purchase pay-to-win loot boxes in other games.

On the future engagement section of the questionnaire, the participants were inquired about the possibly of making purchases in other video games after experiencing the demo game. The question was answered on a Likert-scale, with most participants answering very unlikely and unlikely, apart from 3 that were unsure. By comparing this to participants' previous

history on pay-to-win microtransaction purchases, there is an indicator that those who have avoided these microtransactions in the past will more likely keep avoiding them (see Figure 16).

Regarding the age, gender, or gaming frequency, there was no real indication of statistical significance in the answers to the future pay-to-win loot box purchases question, as the responses were adamant on not buying, or being unsure.

The participants were asked about the possibility of recommending a video game with pay-to-win microtransactions to their friends, and most of the respondents would not recommend a game with these microtransactions. This was another statistic, where comparing the likeness of recommendation to prior experience with microtransactions was used, and the 7 respondents with prior purchases were split 4 to 3 with the latter being open to recommending a game of this type (see Figure 17).

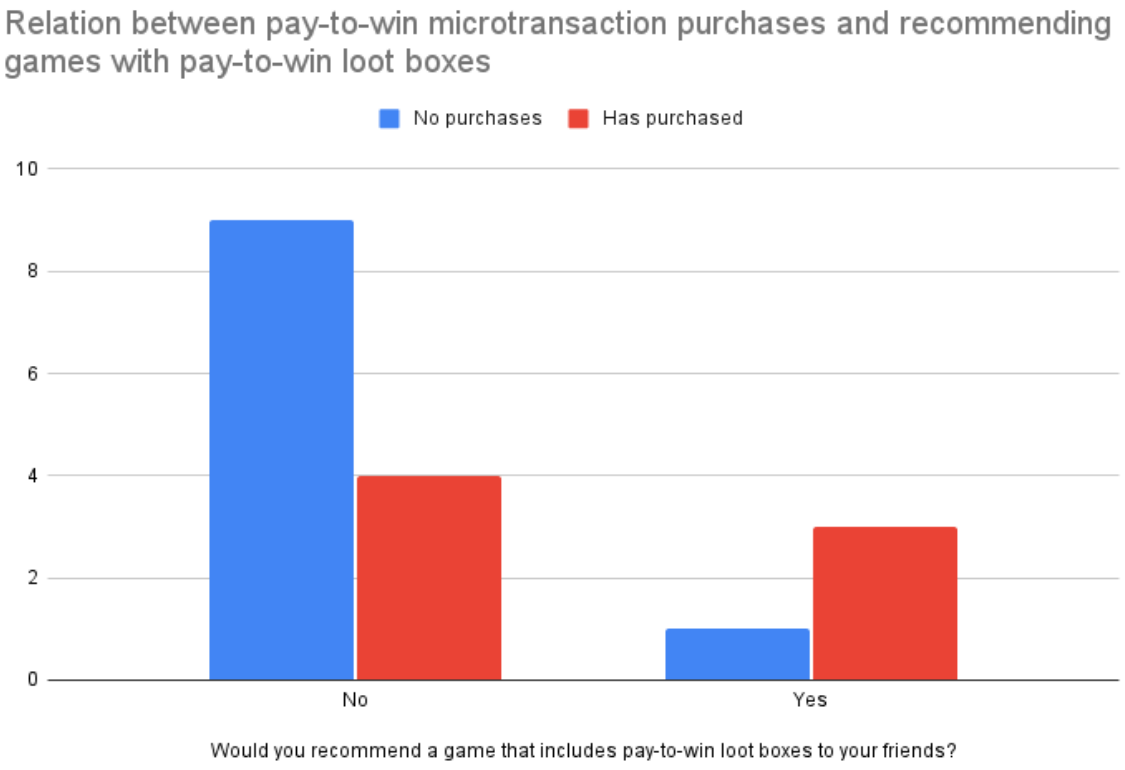

Figure 17. Relation between pay-to-win microtransaction purchases and recommending games with pay-to-win loot boxes.

As with the question regarding future pay-to-win loot box purchases, this question about recommending games with these microtransactions, there was not any notable statistical significance within the responses when it came to the participants' age or gender.

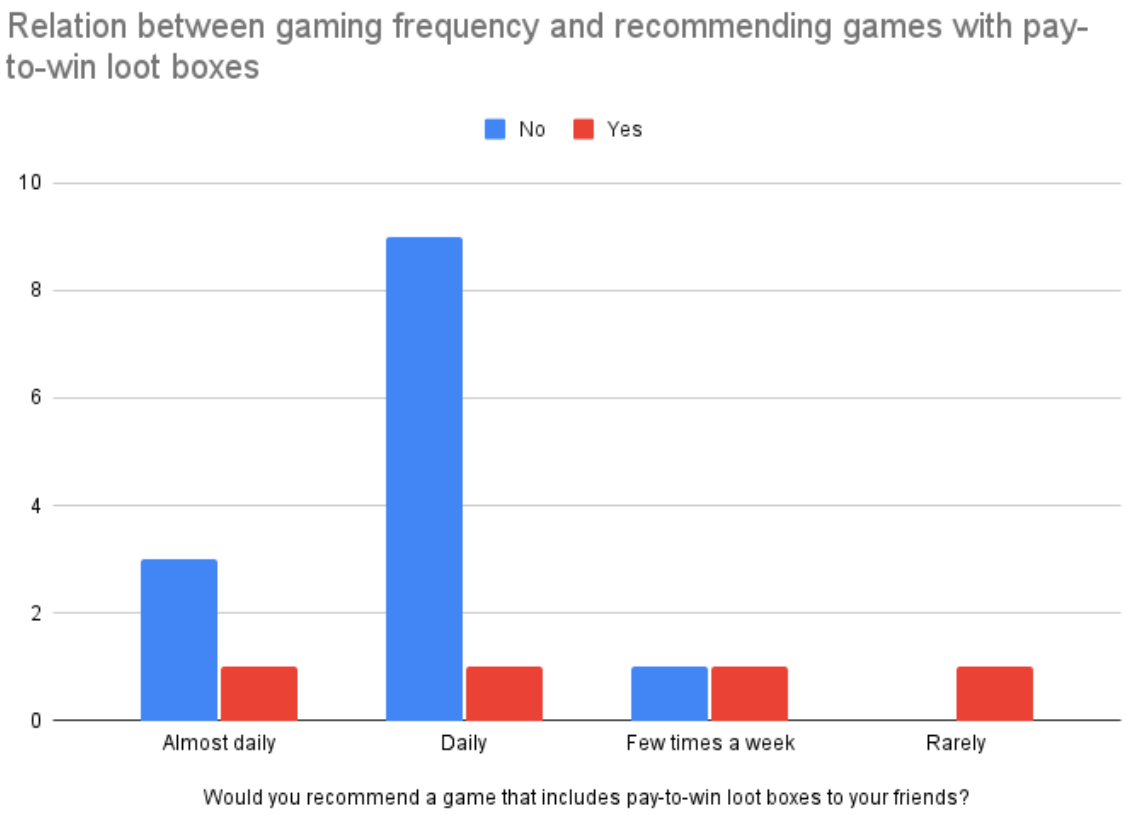

Figure 18. Relation between pay-to-win microtransaction purchases and recommending games with pay-to-win loot boxes.

However, when we consider participants' gaming frequency in relation to recommending games with the pay-to-win monetization method, we can observe the same trend in the respondents with frequent gaming habits as we have noticed before, if the players have more experience in gaming, they are more likely to avoid these types of microtransactions altogether (see Figure 18).

From this quantitative dataset, we can conclude that the overall expectations and attitudes toward pay-to-win loot boxes are generally negative and combine the results utilizing the themes of participants' background and gaming habits together with previous microtransaction experiences.

Interestingly, participants with a history of spending money on pay-to-win microtransaction purchases perceive them as unfair, due to the randomness of rewards and their impact on the fairness of gameplay. We can also conclude that the participants' general opinions towards the microtransactions remained unchanged even if they had prior knowledge and experiences with them, and the probability of these respondents purchasing or recommending pay-to-win loot boxes when it comes to other games was not very likely. The sole reason for changes in the respondents' opinions towards pay-to-win microtransactions was observed to be lack of previous experience or infrequent gaming habits.

5.2 Qualitative data

In this section we will go through the open-ended questions of the questionnaires. The purpose for these open-ended questions was to gain more insight into the participants' responses regarding their opinions and experiences with pay-to-win microtransactions and loot boxes. Some of the open-ended questions were follow-ups to the multiple-choice questions and these will be addressed as we go through the responses.

The first open-ended question was a follow-up to the question, in which the participant is asked to elaborate on their answer to "Do you believe that pay-to-win loot boxes affect the fairness of a game? (i.e. competitive advantage)". As the responses to this question was 14 to 3 in favour of the items giving an advantage, most of the responses mention unfairness of the microtransactions when they offer an advantage in a competitive game in relation to players skill and ability to play, but also bringing up issues related to the inequality between players being able to spend money and of those that can not or do not like to.

> "The socio-economical status of the players shouldn't affect the playing experience - will rich people have an advantage over the poor?" (P17: A14).

On the other hand, the respondents who did not consider pay-to-win loot boxes unfair believed that money can't buy skill and thought that items which do not affect gameplay are still fair.

> "Money can't buy skill." (P11: A14).

The issues brought up in the responses to this question relate to the findings we made in regards to previous literature on this topic. We were able to discover issues on both the

perception of fairness in games containing the pay-to-win microtransactions, as well as the socio-economical status of the players. However, the respondents of these questionnaires did not mention any of the encouragement via social pressure that we discovered in one of the previous research papers.

The next open-ended question was “How do pay-to-win loot boxes affect your enjoyment of a game?” The respondents had mostly negative experiences with games that included pay-to-win loot boxes, while some had not come across them in the games they played. A lot of the respondents also mentioned specifically that they would not play such games especially in the case when a game has competitive elements to it. Some mentioned having spent money on these microtransactions, but also reflected on their thoughts regarding their purchases.

> “Pay-to-win loot boxes very negatively affect my enjoyment of a game. Games, especially competitive, should not have any competitive edge based on the amount of money spent.” (P8: A16).

> “I think pay-to-win loot boxes affect games negatively, but as someone that has bought them, I can see why they can be addictive and feel rewarding when getting rare loot. But looking back into it, I wish I didn’t buy the loot boxes, as the enjoyment was only momentary.” (P1: A16).

However, some of the respondents mentioned that they would be inclined and have spent money on single-player games with pay-to-win elements, although they also reflected on their thoughts regarding their purchases.

> “If it’s a competitive game, I straight up would not play the game. In single-player gacha games (gacha games refer to mobile games that mimic the mechanics of capsule-toy vending machines, the term deriving from the Japanese word ‘gachapon’), like Honkai Star Rail, I do spend on pulls to get characters. It doesn't bother me as much as it probably should.” (P12: A16).

These responses with reflection towards the respondents’ previous pay-to-win microtransaction purchases would encompass our findings in the quantitative data section. Participants who had prior experience with this monetization method typically expressed more negative views.

This is where we move on to open-ended questions on the post-gameplay questionnaire. The first question was about the immediate feedback regarding the demo gameplay. The participants’ opinions were mixed regarding the gameplay, with a few short yes or no answers. Most notable thought from these answers was that the gameplay did get easier as the players received loot items.

> "Yes, given equipment and skills speed up rounds and made a game more enjoyable. With a start equipment it was little frustrating to just rotate map and shoot zombies from afar." (P9: B1).

And this was clarified in the following multiple-choice question and its follow-up regarding changes in the gameplay strategy, where 13 respondents from 17 had changes to their strategy after receiving loot items. The remaining 4 reported that they did not either receive items that gave an advantage or that the items they received were not that impactful. This supports the observation made in the quantitative data, where we speculated on the option of participants noticing the effects of the loot boxes towards the gameplay. The strategy changes revolved mostly around increase in weapon damage or fire rate making the gameplay easier and requiring less running away.

> "I unlocked the AR and fire rate buffs with dmg +20 so I more or less went from playing defensive to super aggressively." (P6: B3).

The following question was regarding the participants' view on games with pay-to-win loot boxes after playing the demo game. This was answered on a 5-point Likert-scale between less fair and more fair, with the follow-up question asking to elaborate on the answer. As most of the responses were either less fair or no change, the opinions regarding games with pay-to-win loot boxes stayed mostly similar as they were on the initial pre-gameplay question.

> "I think my opinion still stays the same, the advantage of getting loot instantly versus having to play and grind for it changes the experience drastically. Although loot is fun, having to pay for it makes it tough to accept." (P1: B5).

Some changes were towards these microtransactions being more fair when it comes to single player games. This would support our prior observations towards the perception of this monetization in single-player games.

> "It depends on the game—pay-to-win loot boxes can be neutral or even fair in single-player games, but they often feel unfair in multiplayer settings." (P3: B5).

The next question was a standalone open-ended question "How do pay-to-win loot boxes impact your sense of achievement in a game?" The answers were slightly mixed, while most felt that the sense of achievement is not as satisfying when compared to achievements reached by playing the game, some did note that the feeling of unlocking all items or getting more powerful can be satisfying on its own, although spending money towards it is not often appealing.

> "There's always that itch to get more just to see how powerful you can get. In the end it comes down to prioritising and return of investment (time). Most of the time it doesn't feel worth it." (P16: B6).

The respondents also mentioned that the implementation of loot boxes in the demo game allows the player to unlock items by playing the game, and they had more positive view towards this type of mechanism, and that they would prefer unlocking items with this type of implementation.

> "Pay-to-win loot boxes undermine my sense of achievement because I'd rather earn rewards through gameplay than buy them." (P3: B6).

And they would even feel a sense of achievement in such cases, where the loot boxes are achieved via gameplay.

> "If the loot-boxes can be acquired via gameplay, like with the demo game, fair enough, made me feel like I had earned them and was progressing in the game, as they came in such natural order." (P4: B6).

The following two questions were conditional follow-ups in regards to changes in the participants initial expectations after playing the demo game. The first one was "Did the demo game meet your expectations of how pay-to-win loot boxes function?" with a follow-up asking how they differ from the expectations. While only 4 responded that they had different expectations, they all were due to the implementation of this demo game, where players could receive keys by playing. Two of the respondents also mentioned that the items included in the loot boxes could have been fewer, or that there would have been only items that provide an advantage, rather than some of the items being cosmetics and not making any difference in gameplay.

> "For quick demo purposes there could have been less items to try out, so you could have seen faster how much the upgrades affect the gameplay." (P16: B8).

The second one was "How has your opinion on pay-to-win loot boxes changed after this simulated experience?" with 3 respondents having similar answers as the previous follow-up question. This follow-up question would also explain the previously observed change in opinion in regards to pay-to-win loot boxes after the gameplay demo, where one participant had more positive view than before.

> "Because the boxes were free, they were more fair than I thought." (P17: B10).

The next question was a follow-up to "Would you recommend a game that includes pay-to-win loot boxes to your friends?" with 13 no and 4 yes answers. The respondents that would recommend a game thought that if they themselves like the game they had no issue recommending it as long as the game was fair without spending money. The respondents that would not recommend a game thought that they can not recommend such games as they do not play such games themselves.

> "I can't recommend other people to spend their money for something I would not spend for myself." (P4: B13).

The responses to this question would further support our observations of participants' opinions on pay-to-win microtransactions in the quantitative data section, particularly in relation to their views on fairness and their willingness to recommend games with this monetization model. The respondents also noted the issues of gambling in the case of loot boxes.

> "Loot boxes put gamers for a different position, which take away enjoyment from gamers who doesn't have money to get different kind of equipment and skills. And even if you have an afford to pay for the boxes, there is no guarantee that you will get something which really helps you in the game, so it's basically lottery." (P9: B13).

The final two questions were open-ended feedback questions regarding the demo game. The first was asking for feedback towards improving the game to make it more fair and balanced. The respondents acknowledged that the loot in the demo was earned by playing, but separating the loot between cosmetic and gameplay improving items was suggested by most responses.

> "The loot boxes felt fair enough in the demo since it's a single-player game, and I didn't encounter any gameplay issues. However, separating cosmetics and power-ups into different loot boxes might make it feel fairer to the consumer." (P3: B14).

There were also recommendations to have only cosmetic items in the loot boxes and to have the gameplay affecting items separately achieved via gameplay.

> "I would recommend that the skins stay in the loot boxes, but that perks and weapons enter some sort of unlock via playing system" (P6: B14).

These responses go along with the previous answers, as the participants' thought mostly that the unfair advantage is as a result of receiving gameplay enhancing items from pay-to-win loot boxes instead of by advancing in the game itself. The last question was not required to be

answered, as it was to collect additional thoughts or comments about the demo game for the author. The responses to this feedback were fairly positive.

> "The game was actually kind of fun and reminded me of yet another zombie defence or vampire survivors." (P6: B15).

6 DISCUSSION

In this chapter, we delve into the analysis conducted in the results chapter, where we investigated the responses from both of the pre-gameplay and the post-gameplay questionnaires. Our examination of these responses has revealed anticipated trends, particularly the prevailing negative perceptions associated with the pay-to-win model. This analysis aims to provide a deeper understanding of the participants' opinions, exploring both their feedback in regards to the responses to the questionnaires as well as their view of the demo game implemented for this research purpose. We will also reflect on how these findings align with existing literature.

The introduction of the topic via the demo game was helpful for a few of the participants, as some had no prior experience in playing games with loot boxes, but for most of those that had played games with such monetization mechanics, the game did not bring much new insights towards this topic.

While the male-to-female ratio of the respondents were 14 to 3, there were few interesting observations regarding the gender of the participants. Male respondents were more likely to have participated in pay-to-win microtransaction purchases, which would align with the previous research in regards to the topic. Male respondents also had a more negative outlook towards the monetization model, while female participants were more positive or impartial. However, these findings regarding gender should be interpreted with caution due to the limited number of responses.

The quantitative data of this research suggests that the participants of this research have mostly negative outlook towards pay-to-win microtransactions. This observation is reflected by the answers to different questions ranging from expectations and experiences to future behavioural intent in regards to the monetization method. The respondents deemed these microtransactions negative from both previous experience as well as after experiencing them via the demo game, which was implemented as a part of the two questionnaires of this research.

After exploring the backgrounds of the respondents, the findings in this research indicate that the participants who frequently play games are more likely to engage in purchasing pay-to-win microtransactions. However, those who have previously spent money on these types of

microtransactions are generally more negative towards them over those without previous experiences, viewing the pay-to-win systems as unfair both for purchasers and within the context of competitive gameplay. The respondents with previous pay-to-win purchases also reflected on their experience in regards to the purchases, stating that in hindsight there might be some level of regret towards spending money on the microtransactions as the thrill of the moment had passed.

This observation made in the quantitative data section was also confirmed in the open-ended responses of the qualitative data section. The respondents were adamant on the fact that the gameplay experience should not be influenced by pay-to-win monetization, as this would favour those players with the ability and willingness to spend money on the microtransactions. This would also be the concern the respondents had in regards to the diminishing importance of skill due to the ability to buy advantages instead of learning the game and getting good at it.

The other point discovered from the open-ended responses regarding pay-to-win microtransactions was their influence in the socio-economical status of the players. The games would favour the rich players over the less fortunate.

Most participants would not recommend games featuring pay-to-win loot boxes, and those who would do so explain this by their personal experiences with perceived fairness in the recommended game. The issues in this category are mostly related to the gameplay advantage provided by the microtransactions, as the respondents feel they can not support games where money gives an advantage to a player. Another reason for not recommending loot boxes is their association with gambling, as responses highlighted concerns about the randomness of obtaining valuable items and the potential for gambling-related issues to arise in some players.

The demo game received some mixed feedback in regards to the implementation of how the loot boxes in the demo did not meet their expectations. However, this approach was primarily chosen to simulate the experience of pay-to-win loot boxes, as using a monetized method in research raises ethical concerns. While this observation on the loot boxes was the minority, most of the participants viewed them suitable for the purpose of its implementation. The positive feedback about the demo game focused on its effective demonstration of how impactful pay-to-win items can be within a game. Cosmetic items were also perceived more

positively, with respondents expressing a preference for these items to be contained in separate loot boxes.

Although the topic of pay-to-win loot boxes is overall viewed negatively by the respondents, some expressed positive insights about the microtransactions when applied to single-player games. The notion towards the positive was in regards to the fairness when the game is being played and experienced by oneself, in comparison to a competitive player-versus-player setting.

The respondents also viewed the inclusion of loot boxes that contain items providing an advantage in gameplay should be obtainable via gameplay rather that spending money. This aspect was not directly addressed in the questionnaire, but could be worthy of future exploration.

Now that we have gone through the results of this research, we can ask ourselves again:

How do pay-to-win loot boxes influence players' experiences and perceptions of fairness within these games?

As our findings indicate, players' perceptions towards pay-to-win loot boxes are mostly negative, as the participants of this research found the microtransactions unfair in nature, both in terms of the gameplay advantage they provide but also in giving the advantage to those with better socio-economic status. Most of the participants with previous experiences in games containing these types of loot boxes expressed that they would rather avoid such games, while some that had not played such games would still try to avoid them, and others would be willing to play them if they deemed the game fair when it comes to gameplay.

These findings align with the research reviewed in the literature review chapter, particularly concerning the fairness of pay-to-win microtransactions, where the respondents regarded pay-to-win systems highly problematic. Although some of the studies had mixed results, the same concerns about fairness were prevalent. Additionally, there were parallels regarding the socio-economic status of players. While this research did not directly focus on the impacts of microtransactions to social values, these issues surfaced in participants' responses regarding the topic on the previous research section.

Overall, the inclusion of pay-to-win loot boxes in video games is perceived as troublesome, as the impact they have on players experiences especially in the context of competitive

player-versus-player gameplay can be detrimental to players choosing to play a game. Game developers should have this in mind when designing the next systems to replace existing pay-to-win microtransactions.

7 CONCLUSION

The aim for this research was to take a deeper look into players' perceptions and experiences towards pay-to-win microtransactions, and loot boxes in particular. As a part of this research was the implementation of a demo game to provide an insight into the monetization model, as well as create an experience for the participants playing the demo game. The findings discovered from the pre-gameplay and post-gameplay questionnaires aligned with the previous research explored in the literature review chapter, as most of the participants considered the practice of pay-to-win loot boxes unfair for both the purchaser and the competitive player. The secondary finding was made in relation to the socio-economical aspect of pay-to-win monetization methods, as the model can provide an advantage to players capable of spending money over the less fortunate players. A third notion was towards the potential for gambling-related issues to arise in some players.

There were some limitations in conducting this research, as we acknowledged in some of the prior chapters.

- The topic itself is quite specific, and the available literature regarding pay-to-win loot boxes specifically was quite limited, although fortunately some of the literature on pay-to-win microtransactions had included loot boxes within the research, and the topic of pay-to-win microtransaction covers this topic on its relation to the perceived fairness of the monetization methods.

- The search for participants was not as successful as expected, as the forum post had over 300 clicks, but the conversion to respondents was minimal. The reason for this is just speculative, but it might have been due to the implementation of the game in downloadable format, while this could have been more successful in reaching participants, had the game been browser supported.

- Some limitations within the demo game were the ethical reasoning for not including payments, but also as one of the respondents to the questionnaires pointed out, the game could have included an in-game currency system which could be more relatable to spending money, rather than the key system.

Future research could benefit from a broader focus on pay-to-win microtransactions, rather than exclusively on pay-to-win loot boxes, which are less common. There could also be a road to explore within the socio-economic implications of microtransactions in video games. As monetization methods continue to evolve, research should delve deeper into the player's experience and consider examining the perspectives of video game developers. There could also be room for investigating the next and upcoming monetization methods in the field of video gaming.

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Appendix A: Pre-gameplay questionnaire

This is the questionnaire the participants answered before playing the demo game.

1. Age
2. Gender
3. How often do you play video games?
4. Do you prefer to play singleplayer or multiplayer games?
5. What genre of games do you typically play?
6. Do the games you typically play include pay-to-win microtransactions?
7. Have you purchased pay-to-win microtransactions in video games?
8. If yes, in which games? (pay-to-win microtransactions)
9. Have you purchased pay-to-win loot boxes in video games before?
10. If yes, in which games? (pay-to-win loot boxes)
11. How would you rate your general view of pay-to-win loot boxes?
12. Do you think pay-to-win loot boxes are fair for the buyer, regarding the random loot the players receive?
13. Do you believe that pay-to-win loot boxes affect the fairness of a game? (i.e. competitive advantage)
14. Please elaborate your answer to the previous question regarding fairness of pay-to-win loot boxes.
15. Would you be inclined to spend money on loot boxes if they clearly offered a competitive advantage?
16. How do pay-to-win loot boxes affect your enjoyment of a game?

Appendix B: Post-gameplay questionnaire

This is the questionnaire the participants answered after playing the demo game.

1. Describe your experience playing the demo game with the simulated pay-to-win loot boxes. Was it enjoyable?
2. Did your gameplay strategy in the game change based on the loot you acquired?
3. How did your gameplay strategy change?
4. Post-game, how do you view the fairness of games that include pay-to-win loot boxes?
5. Please elaborate your view on fairness regarding the previous question.
6. How do pay-to-win loot boxes impact your sense of achievement in a game?
7. Did the demo game meet your expectations of how pay-to-win loot boxes function?
8. If not, how did they differ from your expectations?
9. How has your opinion on pay-to-win loot boxes changed after this simulated experience?
10. If your opinion changed, please elaborate on that.
11. After playing the demo, how likely are you to use real money to purchase pay-to-win loot boxes in other games?
12. Would you recommend a game that includes pay-to-win loot boxes to your friends?
13. Please elaborate on your answer on recommending games with pay-to-win loot boxes.
14. What improvements or changes would you suggest for the loot boxes in the demo game to make them feel more balanced and fair?
15. Any additional thoughts or comments about your experience with the demo game and its simulated pay-to-win elements?