SPENDING DISPARITIES BETWEEN HIGH AND LOW SPENDERS IN GAMING: CASE STUDY "CALL ME EMPEROR"

by

PHAM MINH PHUONG, BBA, PGDip

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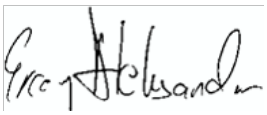
Supervised by

Dr. Anna Provodnikova

APPROVED BY 

Dissertation Chair

RECEIVED/APPROVED BY:

Renee Goldstein Osmic

Admissions Director

Dedication

This study was undertaken to uncover the underlying factors contributing to the remarkable success of the gaming business, particularly in the realm of mobile games. To execute the project, I engaged in the gameplay of a mobile game titled "Call Me Emperor", I created an account and directly played in this game for 03 years as a loyal player of the game and participated in the player community deeply to be able to truly understand the feeling of "living in the game and living for the game" for the purpose of completing this research. As an avid gamer, I have observed my in-game character's gradual development and integration into the player community. Unintentionally, I have repeatedly invested money in enhancing my game characters. Through this experience, I have become aware of the manufacturer's tactics in manipulating players' psychology and generating substantial profits through psychological manipulation. Hence, this thesis seeks to uncover the underlying cause behind players' "addiction" to games and their inclination to deposit money within them, drawing upon research and analysis from neuroscience, psychology, and social impact. Consequently, we can gain mastery over our cognitive processes when engaging in gaming and making in-game transactions.

Acknowledgements

To have completed this thesis has been an arduous voyage, and for that, I am profoundly appreciative of my family, friends, and colleagues who encouraged and supported me during the weariest moments. I successfully concluded the assignment today as a result of their assistance. They have my sincere appreciation. Before anything else, I would like to extend my deepest gratitude to my parents, who provided financial assistance and unwavering support while I labored over the days necessary to complete my thesis. The unending affection and support of my parents served as my primary impetus to finish my thesis and continue on the path to knowledge acquisition. Furthermore, I would like to extend my sincere appreciation to my immediate supervisor, Dr. Anna L. Provodnikova, who not only taught me the adage "Knowledge is power" but also accompanied me through every obstacle I encountered during this journey to complete the thesis. Thank you very much, Dr. Provodnikova, for encouraging me to complete my thesis despite the challenges I faced in my career and for your support when I was gravely unwell. Lastly, I would like to address this correspondence to my esteemed colleagues and close friends at Oxford University and the Swiss School of Business and Management (SSBM), both of which I represent and attend. Your assistance throughout the research process and your realization of the immense scope of knowledge are greatly appreciated. Everyone, once more, is to be thanked for accompanying me and assisting me in completing my thesis.

ABSTRACT

SPENDING DISPARITIES BETWEEN HIGH AND LOW SPENDERS IN GAMING

CASE STUDY “CALL ME EMPEROR”

PHAM MINH PHUONG

April 2025

Dissertation Chair: Aleksandar Erceg, PhD

Mobile games have become a dominant force in the entertainment industry, prompting an investigation into the motivations behind in-game spending. Current research largely focuses on the social and psychological impacts of gaming, lacking practical insights into the commercial success of specific game models. This study aims to identify the factors driving player spending in mobile games, using "Call me Emperor" as a case study, and propose a commercially viable game model. A mixed-methods approach, including interviews with industry professionals and gamers, was employed to analyze player motivations and spending patterns. Results indicate that a combination of psychological, social, and neuroscience factors, particularly the use of compelling non-player characters (NPCs) and strategic monetization, significantly influences player spending. This research concludes that a formula exists to create commercially successful mobile games by understanding and leveraging these factors. Future research should explore the long-term effects of specific game mechanics on player retention and spending behavior.

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CHAPTER I: INTRODUCTION

1.1 Market research background and significance of the study

1.1.1 Market for online game

The online game industry is rising to become a billion-dollar empire with unbelievable revenue even during the Covid-19 pandemic. The market share of the online game industry reached 196 billion dollars in 2022, and of all gaming revenue, around 80% (accounting for 55 billion dollars) came from mobile games (Visual Capitalist, 2020). With the 5G era quickly descending upon us, although still a relatively new segment of the online gaming industry, mobile gaming has developed at an astonishing rate with more than 2.4 billion people playing mobile games in 2019 in fact, mobile games are the third most popular application type, closely following social media and shopping applications (Jones, 2020). In the Vietnamese market, the revenue from mobile gaming increased from 4,968 trillion billion Vietnamese Dongs in 2015 (around 225 million dollars) to 12,000 tril, billion Vietnamese Dong (around 546 million dollars) in 2022, according to public statistics from the Ministry of Information and Communication (MIC) and Nguyễn (2024). Under the mindset of the game developers, there are two popular ways to earn revenue in this industry: first is to sell the games, within the context of online games, to sell the entire game brand (VnExpress, 2021). Another way is to sell "virtual goods" for real money which the game developers need to design game tricks to attract players to buy virtual goods in games, in other words, to stimulate lots of "war" and competition in the game context to enhance the contribution of players and then "pickpocketing" their wallets to spend on "virtual goods" (Hamari and Lehdonvirta, 2010; King and Delfabbro, 2019). Specializing in this study, factors and theory of consumption values that affect the player's intention to purchase virtual goods in online games need to be investigated, along with behaviors related to intent to purchase virtual goods in online games (Hsiao and Chen, 2016; Ho and Wu, 2012). Thus, as a game publisher and wanting own commercial product to be successful, the author of this thesis aims to find out and explain why there are gamers who focus on playing games for more than 48 hours

non-stop, and are willing to spend no less than $500,000 to top up to buy items and equipment for their in-game characters (Zendle et al., 2023). Finding out what motivates these gamers to use "real money" in their bank accounts to top up equipment for their in-game characters is something that the author is interested in and wants to find out the motivation behind the "reckless spending" of this group of players (Weinstein et al., 2017). In addition, in complete contrast to the group of "rich" players, the group of "low-money" players will by all means refuse to top up in-game transactions and maintain their "free play" stance (Dreier et al., 2017). This seemingly distinct difference between heaven and hell becomes the main point in the author's research. This analysis is to help optimize monetization strategies, enhance understanding of personal spending habits, inform decisions for entering the mobile gaming market, and explore the dynamics of this thriving industry. This study aims to provide insights into the psychological, social and elements that influence spending decisions in mobile gaming, specifically targeting gamers and to provide entrepreneurs seeking to enter the mobile gaming sector with valuable insights into the market landscape and the key variables that drive its success. Specifically, the author's study focuses on the examination of brain responses during gameplay, particularly in the field of neuroscience (Montague et al., 2023). This study is to explain the differences in game spending between the high and low spenders by examining the neurophysiology of addiction in gaming and its connection to spending behavior (Fauth-Bühler and Mann, 2017). Additionally, it is to investigate the neuroeconomic research on the psychological factors underlying both high and low spending in gaming (Dennison, Sazhin and Smith, 2022).

1.1.2 Mobile game market data

It is necessary to research the game market in different territories and regions. After two years of expansion due to the lockout durign the Covid-19 Pandemic, the mobile gaming market corrected in 2022 and 2023 (Knezovic, 2024). Global recession, IDFA changes, and a chaotic Chinese gaming business also contributed to the market's downturn (Newzoo, 2024; Sensor Tower, 2024). The fall after the shutdown was predicted, and the gaming business is stabilizing, so we're confident about mobile gaming's future and that mobile gaming is the most profitable and successful in 2024 (Data.ai, 2024; GlobalData, 2024). The mobile game market figures are as follows:

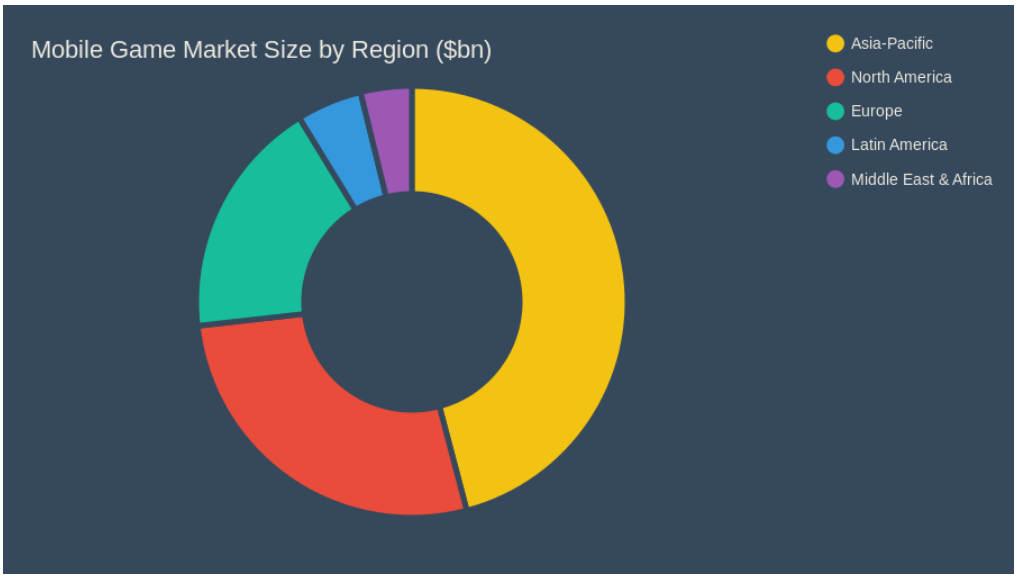

Figure 1. Report about mobile game market size by regions (Source: Knezovic, 2024)

According to Knezovic (2024), global games revenue, including mobile and other platforms, exceeded $184 billion in 2024, marking a 0.6% increase from the previous year. The global gaming market revenue is projected to reach $205 billion by 2026; Asia Pacific remains the largest game market, $84.1 billion in revenue despite a 0.8% decline. Meanwhile, the North American market grew by 1.7% to $50.6 billion and 0.8% rise to $33.6 billion in Europe (Knezovic, 2024).

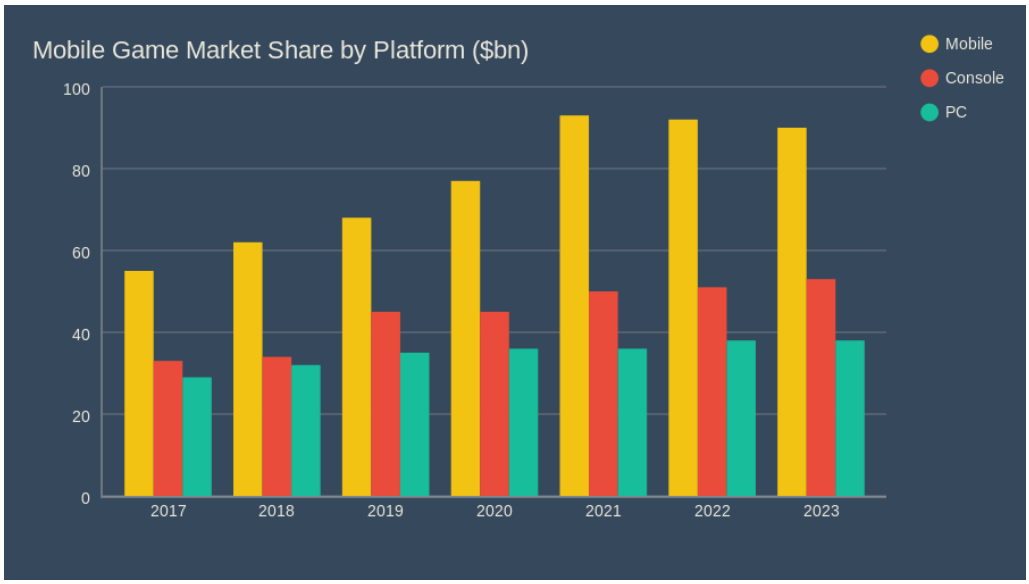

Figure 2. Report about mobile game market share by platform (Source: Knezovic, 2024)

Mobile games accounted for 49% (approximately $90 billion) of the total $184 billion global gaming revenue in 2023, making up more than half of the entire industry while console gaming generated $53 billion (29%) and PC games contributed $38 billion, representing 21% of the market. Browser-based PC games made up just 1% (Knezovic, 2024). As in previous years, smartphone games dominate the market.

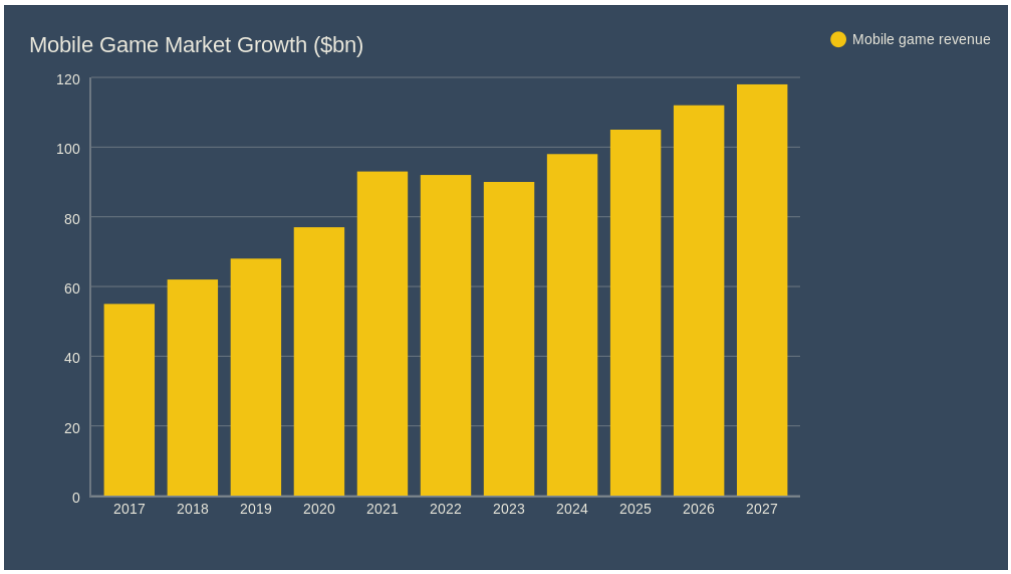

Figure 3. Report of mobile game market growth (Source: Knezovic, 2024)

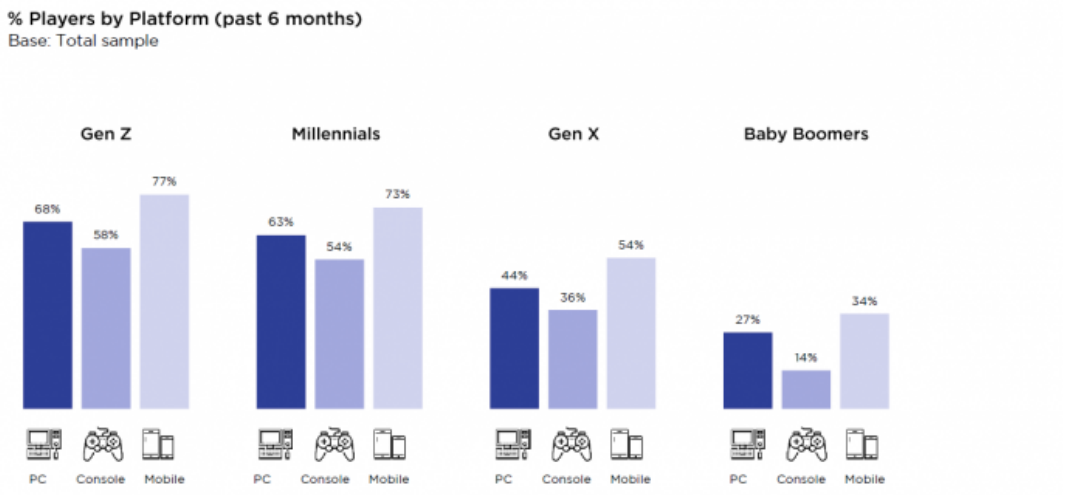

Figure 4. Report of proportion of players by platforms (past 6 months) (Source: Knezovic, 2024)

According to Knezovic (2024), 29.5% of mobile gamers are aged 25-34 and 28.3% are aged 16-24. Mobile gamers also include 23.1% aged 35–44, 12.8% aged 45–54, and 6.3% aged 55 and. Additionally, 77% of Gen Z, 73% of Millennials, 54% of Gen X, and 34% of Baby Boomers play mobile. Generation Z and Millennials engage with games more than with any other form of entertainment while 85% of smartphone gamers do not identify as gamers (Knezovic, 2024). The North American market is the target for most game publishers, and study on this region's spending habits reveal insightful (King, 2024).

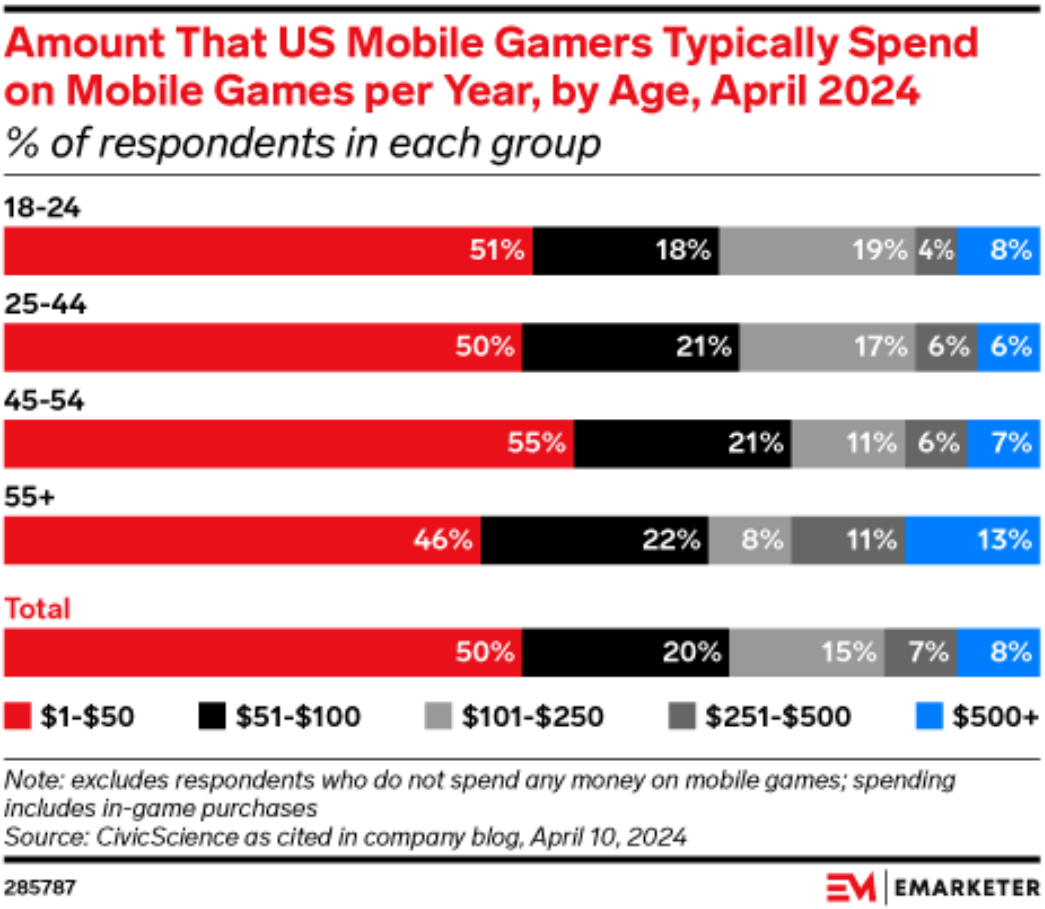

Figure 5. Report of the spending amount on mobile game yearly by age in US market (Source: Knezovic, 2024)

An April 2024 CivicScience survey found that 50% of adult US mobile gamers spend between $1 and $50 per year on games (CivicScience, 2024). According to eMarketer, in-app purchases from mobile games in the US

are expected to reach $23.44 billion in 2024, with $22.50 billion attributed to virtual items. The same forecast predicts that mobile game ad revenues in the US will reach $7.77 billion. In addition, the Interactive Advertising Bureau (IAB) reports that 76% of US marketing decision-makers prioritise mobile in-game advertising (eMarketer, 2024). Mobile gaming continues to be a lucrative sector. GlobalData predicts that mobile gaming revenues will reach $195 billion globally by 2030 (GlobalData, 2024). Furthermore, Activision Blizzard Media reports that 86% of users in the US and UK play mobile games weekly, and 53% play every day (Activision Blizzard Media, 2024). Based on this market data, the author concludes that the mobile game business model is designed to drive commercial success by increasing download and engagement rates. Therefore, the author's game targets users aged 10–40 — encompassing Gen Z, Gen Y, and Millennials — with a focus on Southeast Asia and North America (Knezovic, 2024).

1.2 Theoretical background

The economics of digital entertainment increasingly rely on understanding consumer behaviour within virtual environments. The propensity for players to engage in in-game purchases directly impacts the revenue models of game publishers (Lin and Kim, 2016). Therefore, understanding the neurophysiology of gaming addiction becomes crucial, as it pertains to comprehending the brain's response to gaming stimuli, resulting in addictive behaviours (Legault, Liu and Balodis, 2021). Game publishers must possess knowledge of the neurological processes involved since they can have a substantial influence on their income and game design tactics. Through an examination of the neurological circuits linked to gaming addiction, game developers may create games that engage players while also taking into account the possible hazards of excessive expenditure. In addition, the subchapter is to provide insight into the neuroeconomic research on the psychological processes underlying excessive and minimal expenditure in gaming. Neuroeconomics integrates the disciplines of neuroscience, psychology, and economics to comprehend the processes of decision-making and the fundamental mechanisms of the brain that drive them (Dennison, Sazhin and Smith, 2022). Through the examination of neuroeconomic variables that impact consumer buying patterns, game producers may customize their monetization tactics to optimize income while guaranteeing user contentment

(Montague et al., 2023; Fang et al., 2019). In addition, from a neurobiological perspective, we can comprehensively explain that "game addiction" does not stem from "emotions from the heart", but rather from neurocognitive processes in the brain (Weinstein and Lejoyeux, 2020; Fauth-Bühler and Mann, 2017). Internet Gaming Disorder (IGD) is a suspected mental illness listed in the DSM-5, requiring further investigation (American Psychiatric Association, 2013). The UK National Institute of Mental Health recommends using Research Domain Criteria (RDoC) instead of subjective symptom experience to categorize IGD by its neurobiology and symptoms (Kuss, Pontes and Griffiths, 2018). This study reviews the neurological correlates of IGD based on current knowledge. After applying exclusion criteria, 27 studies using fMRI, rsfMRI, VBM, PET, and EEG methods were reviewed from 853 studies on neurobiological correlates found on ProQuest and MEDLINE (Kuss, Pontes and Griffiths, 2018). The findings show substantial neurological differences between healthy controls and IGD patients, with gaming addicts exhibiting impaired response-inhibition and emotion regulation, prefrontal cortex dysfunction, reduced working memory, and decreased visual and auditory processing. Substance-related and behavioral addictions may share common neurobiological substrates and be part of a broader addiction syndrome. Future research should replicate these findings across cultures to support a neurobiological classification of IGD and related disorders. Based on experimental literature reviewed by the author, it can be argued that "game addiction" is a psychological mechanism rooted in neurobiological dysfunction, particularly affecting behavior regulation. This implies that individuals with gaming addiction may have compromised brain function that impairs self-control, leading to compulsive spending without full awareness of their actions (Fauth-Bühler and Mann, 2017; Weinstein and Lejoyeux, 2020; Montague et al., 2023).

1.3 Objectives of the research

This research aims to determine the primary factors that lead to the disparity in expenditure within the mobile gaming industry. Through the examination of player demographics, game mechanics, and in-app purchase possibilities, our objective is to identify the fundamental elements that motivate high spenders to make substantially larger financial investments in mobile games in comparison to low spenders. Acquiring this insight would empower

game publishers to develop more focused marketing tactics and game elements that specifically cater to certain player categories. Moreover, our objective is to examine the psychological and behavioural factors that impact spending patterns in mobile gaming. Through the use of surveys, interviews, and the examination of player data, our objective is to comprehend the motives, preferences, and decision-making procedures of individuals who spend a significant amount of money in contrast to those who spend less. This analysis would offer significant insights into the psychological factors that influence differences in spending patterns. It would assist entrepreneurs and developers in designing gaming experiences that are more captivating and conducive to generating revenue. Additionally, this subchapter aims to offer a thorough comprehension of the neurological and economic elements that impact spending behaviorur in gaming. Through an examination of the neurophysiology of addiction, game producers may get useful knowledge about the addictive qualities of their games and make well-informed choices about game design and monetization tactics. Similarly, individuals who engage in gaming can get a heightened understanding of the neurobiological mechanisms that drive their spending patterns, enabling them to make deliberate decisions and efficiently regulate their gaming expenditures (Weinstein and Lejoyeux, 2020). In order to study the neurophysiology of addiction in gaming, researchers may analyze the neural pathways and brain areas that are associated with addictive behaviors. And, to examine the psychological mechanisms underlying high and low spending in gaming, neuroeconomic investigations can analyze decision- making processes and cognitive biases that influence spending behaviors (Wang, Abdelhamid and Sanders, 2021). Furthermore, our research endeavors to investigate the influence of unequal expenditures on the entire mobile gaming environment. Additionally, we seek to offer practical and valuable information to game publishers, players, entrepreneurs, and general readers. To better understand the patterns observed throughout this dissertation, the following research questions have been developed as a compass to guide both the methodology and analysis:

1. Why do some users spend significantly more than others in free-to-play games?
2. What psychological and neurological factors might explain these disparities?
3. In what ways do in-game design and community dynamics contribute to higher spending behaviour?

These questions aim to uncover not just the what, but the why behind spending habits in mobile gaming by looking at both individual motivations and the structural mechanisms embedded within the games themselves.

1.4 Scope and limitation

The survey we conducted covers a diverse spectrum of mobile gaming platforms and genres, allowing for a thorough investigation of differences in expenditure. We analyzed widely recognized games spanning several genres, such as casual, puzzle, strategy, and role-playing games, among others. Our objective is to obtain a comprehensive understanding of the spending patterns that are often observed in the mobile gaming market by including a wide range of games. In order to examine the disparity in expenditure, we would utilize a blend of quantitative and qualitative research methodologies. We collected data from credible sources, such as in-app purchase records, user surveys, and interviews with industry experts, to provide important insights into the expenditure patterns of those who spend a significant amount and those who spend a little amount. Our study had examined variables such as demographics, socioeconomic position, gaming interests, and motives for spending, enabling us to provide a comprehensive depiction of the spending disparity. Nevertheless, it is crucial to recognize the constraints of our research. Our research would be constrained to a specific time period, specifically the past ten years, in order to offer a thorough analysis. This time range allows us to examine current patterns and advancements in the mobile gaming sector. Furthermore, our research is to primarily concentrate on English- speaking markets, which may limit the applicability of our findings to a worldwide audience. Furthermore, we acknowledge that the disparity in expenditure within the mobile gaming industry is influenced by a multitude of intricate components, including psychological, social, and cultural dimensions. Although we make every effort to consider these aspects to the fullest extent of our capabilities, it is crucial to recognize that our analysis may not encompass all the complexities of the situation. By comprehending the extent and constraints of our investigation, our audience may approach our research with pragmatic anticipations. We anticipate that our findings would not only be advantageous to game publishers and entrepreneurs in enhancing their monetization techniques, but also enable gamers to make well-informed choices regarding their expenditure patterns. Furthermore, our research is to make a valuable contribution

to the wider discussion on the mobile gaming business by highlighting the frequently neglected discrepancies in expenditure and their consequences. The value point of this study is to investigate the neurophysiology of gaming addiction and its connection to spending behavior. Addiction is a multifaceted condition that impacts individuals in several areas of their lives, including the realm of gaming (Chappell et al., 2006). Furthermore, this work explores neuroeconomic inquiries into the psychological processes underlying excessive and minimal expenditures in gaming. Through the examination of players' economic choices inside gaming environments, game publishers may customize their game design and monetization tactics to improve player experiences while upholding an equitable and viable business model. Game players who possess a grasp of the psychological aspects that impact their spending can make informed decisions, enhance their financial stability, and prevent themselves from engaging in patterns of excessive spending (Zendle et al., 2023).

1.5 Overview of gaming expenditure studies

1.5.1 Definition of mobile gaming spending

"Mobile gaming spending" denotes the financial transactions conducted by gamers within mobile games. These transactions involve several activities, including in-app purchases, subscriptions, ad income, and exchanges of virtual money (Zendle et al., 2023). Understanding the notion of mobile gaming expenditure can increase the entire gaming experience for gamers. Gaining a comprehensive understanding of the mechanics behind in-app purchases or subscriptions enables gamers to make well-informed choices on their expenditure patterns (Ravoniarison and Benito, 2019). Furthermore, it allows them to assess the value proposition of various gaming features and content, ensuring that their investments are in line with their expectations. Entrepreneurs who are venturing into the mobile gaming sector might utilize knowledge about mobile gaming expenditure to create inventive business methods and techniques. Through the identification of regions exhibiting discrepancies in spending patterns, one may investigate unexplored market prospects and develop strategies to bridge the divide between individuals with high and low expenditures. Entrepreneurs may utilize this information to develop sustainable sources of income and cultivate a dedicated user community. General readers with an interest in the

mobile gaming industry may get significant knowledge about the disparity in spending by analyzing the patterns of expenditure in mobile gaming (Cheng-Hsun Ho and Ting-Yun Wu, 2012). This offers a brief insight into the economic dynamics of the mobile gaming business, its influence on player behavior, and the wider consequences for the gaming ecosystem.

1.5.2 Online game

The creation of mobile internet games involves the incorporation of several players and users who are situated in various locations at present (Lehdonvirta, 2009). Typically, players and users have been engaging with one another and sharing information over shared internet connections. Additionally, they have been "living" in virtual worlds that are located inside the same time zone as the specified locations (Costikyan and Mulligan, 2003). To describe online games, which may include both computer games and mobile games, online games are primarily associated with the simultaneous interaction between players and the internet (Curtis, 1997). It is abundantly evident that the makers of the game have successfully incorporated components of reality into a virtual environment. As a result, players get the impression that they are living a second existence on a second planet, while the actual world is unable to "feed" them (Yee, 2006; Jansz, 2005). The reason for this is that players are captivated and have the impression that they are living inside the game. Furthermore, when they deposit their real money to invest in their "in-game characters," they get the impression that they are investing in themselves to accomplish something that they are unable to do in their real life (Guo and Barnes, 2009; Wohn, 2014). There have been many examples of different kinds of games played online, each offering players a sense of escape, mastery, or identity that compensates for unmet needs in the physical world (Griffiths, King and Delfabbro, 2021). Online games can be broken down into the following categories: role-playing games, action games, shooting games, sports games, racing games, adventure games, puzzle games, and war strategy games (Lin and Sun, 2007). This classification was developed by Live Gamer, a highly regarded Singaporean game developer who has been hosting several game tournaments in Vietnam (Live Gamer, 2024). When it comes to the many categories of online games, role-playing games have consistently ranked as the most popular category of contemporary online games (Yee, 2006). When it comes to the traditional category

of online games, war-strategy games (like Call me Emperor or CME) have been able to keep their place at the top of the list (Hamari and Lehdonvirta, 2017). Players are required to examine the characteristics of these two categories of games to have a comprehensive comprehension of how to differentiate between them (Bartle, 2004). Role-playing games have been taking advantage of image value by employing graphic design styles that are both attractive and beautiful (Guo and Barnes, 2009). This is done to enhance the perceived value and aesthetic thinking of players, while simultaneously stimulating people's instinct to love beauty to assist them in feeling relaxed and gradually integrating themselves into the game character. Through the inherent need to prove themselves and the idea that "no one knows who they are in real life," beauty-oriented players enhance the urge to participate with the community and society in the game world. This is to be accomplished by creating a new persona inside the game world. Game theory, on the other hand, is the foundation upon which military strategy games are built. The interactions between users are the primary focus of their attention. As can be observed, the framework of the strategy game is designed to excite the players' desire to win to the fullest extent possible, allowing them to use any methods available to them. Because there are no restrictions placed on the game, the level of violence or the attitude of "the strong crushes the weak" is increased to its full potential (Blanchard and Markus, 2004). This is how players are motivated to recharge while they are playing the game. Outstandingly, when we look at the video game named "Call Me Emperor" (also known as CME for short), we come across a typical illustration of this pattern. CME is a game of combination both role-playing and war-strategy games with the creation of a virtual Chinese empire where players will be given a chance to become Emperors or Empress to rule their country. As an Emperor or an Empress, players can experience the real power in the game including having consorts, training and managing their ministers, decorating their mansions, daily solving problems at the governance hall, raising their children who can be their future Crown Prince or Princess and then, when their nations can be strong enough, players fight for the win in competition ranking with other player’s nations. Therefore, to reach the overall successes within the competition, players need to choose which “title in game” they need to prioritize and spend their focus and resources to aim for, due to the high number of

competitive players at the same time with them. And that's the way CME makes money: winning "tittle" means to recharge money infinitely.

Figure 6. Author's screenshot of CME game: Fighting for "title" and ranking on CME (Source: by author, 2024)

1.5.3 Virtual goods

One of the most notable examples of contemporary online games that sell virtual items to make cash and enhance player engagement is CME. To research the theory of consumption and the elements that influence the intention to acquire virtual goods in online games, this study makes use of role-playing games and military strategies inside CME games. As of right now, the time has long since gone for the game publishers to sell their whole property to generate a profit. The key sources of income for online game vendors are virtual products, which have completed their aim of providing passive profit streams (Lehdonvirta, 2009). This mission has been well fulfilled. In 2007, virtual products were classified into two categories: functional tools and ornamental tools. Lin and Sun have detailed the distinction between these two categories (Williams and Kirschner, 2012). The usage of ornamental tools has been giving the in-game appearance backdrop to make the game more appealing to players. Functional tools, on the other hand, have been increasing the level of competence of the game users. Vanity goods, utilitarian goods, and social

goods are the three categories of virtual goods that have been included based on the information provided by Live Gamer.

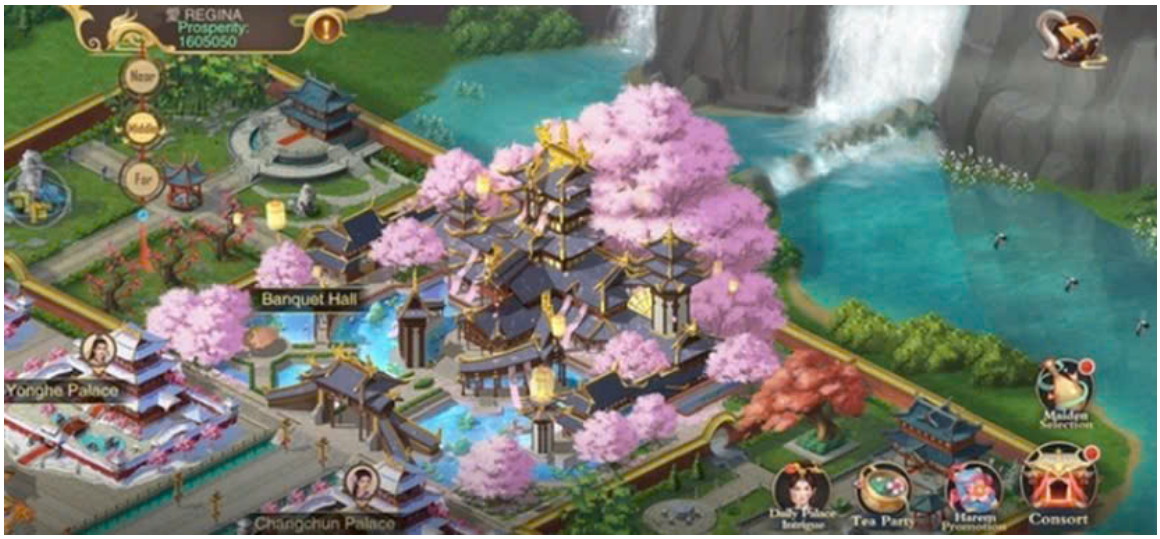

Figure 7. Author's Screenshot of CME: Decorative tools on CME which are the game's graphics increase the players' ability to be attracted and recognize the context of the game (Source: by author,2023)

As with ornamental tools, vanity products are similar. Similarly, to functional instruments, functional items are also functional. Social goods are presenting that player of a game may send to other players of the same game (Auger et al., 2009). As stated in Guo and Barnes's (2009) assessment, there are three primary reasons why players are compelled to purchase virtual items (Guo and Barnes, 2009). These reasons include the perceived fun of the game, the character's level of ability, and the needs of the mission environment (Park and Lee, 2014). The term "perceived playfulness" refers to the sense of fun and curiosity that game players experience. The competence of the game user is referred to as the character's competency. Additionally, to keep the interest of players of the game sustained, it is required to supply daily quests and game materials that allow the game user's character to carry out a game task. This is done to maintain the competence of the game users. In 2009, Lehdonvirta demonstrated that not only are virtual products practical, but they also possess emotional and social dimensions. Included under the category of functional attributes are performance and functionality (Lehdonvirta, 2009). The look, the origin, the

potential to be customized, and the uniqueness of the item are all examples of emotional and social attributes (de A. Campos et al., 2012)

CHAPTER II: LITERATURE REVIEW

2.1. High spenders with low spenders in mobile gaming

High-spending players, sometimes referred to as "whales" in the gaming industry, are a particular subset of players who make a significant contribution to the overall revenue generated by a game (Wohn, 2014). People who belong to the group of players with a lot of money often tend to spend money to "upgrade their experience" in the game, such as to buy "goods" and in-game items, or to unlock new features to upgrade their characters in the game (Gainsbury et al., 2016). Thus, for this group of people, they tend to "spend money to buy experience". This is a group of players who are willing to invest very seriously and consider spending money on games as an investment (Zendle et al., 2023). On the other hand, low spenders, sometimes referred to as "minnows", are those who actively play in mobile games but have a more frugal attitude when it comes to making purchases inside the game (Wohn, 2014). These are the people who rely on actively participating in completing in-game tasks, watching in-game advertisements, or accumulating "stuff" through making small payments to maintain their gaming experience (Gainsbury et al, 2016). With the exception of individuals who are willing to spend extremely large amounts of money in games, low spenders make up the majority of players in and downloads of games, and are therefore considered by game developers to be "potential converts" and to play a role no less important than "high spenders." Therefore, finding a way to understand the psychology of low-income players serves as a strategic goal for game developers to promote and create commercial success for their games. Through an analysis of the discrepancies in spending patterns among these two cohorts, we may get significant information into their distinct motives, preferences, and behaviors. Player demographics, game design, monetization tactics, and social dynamics are all influential factors in determining the purchasing habits of big spenders and low spenders. Moreover, the examination of expenditure trends might assist game producers in recognizing prospective avenues for increasing income and enhancing user contentment.

2.2 Factors influencing mobile gaming spending

The player's degree of involvement is a significant determinant of mobile gaming spending. Enthusiastic players who dedicate a substantial amount of time to playing and are heavily involved in the game's storyline and gameplay generally likely to spend more money (Choi and Kim, 2004). These gamers are more inclined to engage in in-app purchases, such as acquiring power-ups, virtual currencies, or exclusive products, to enhance their gaming experience and acquire a competitive advantage. In contrast, casual gamers, who engage in intermittent gameplay and have a less fervent emotional connection to the game, are more inclined to spend a smaller amount of money or not spend at all. The game's monetization approach, or in other words, psychological motivation is a significant determinant in mobile gaming spending (Chamarro et al., 2020). Various games employ diverse strategies to generate income, such as in- app sales, subscriptions, or adverts. Games that provide engaging and worthwhile in-app purchases, without causing any disruption to the general gameplay experience, tend to draw greater expenditure from users. Moreover, games that create a feeling of exclusivity or present time-limited events and incentives frequently encourage users to increase their spending. The player's demographic and socio-economic background is another influential element affecting mobile gaming expenditure (Grönroos et al., 2021). Studies have demonstrated that younger individuals, specifically those from Generation Z and Millennials, have a higher propensity to allocate funds towards mobile gaming in comparison to earlier generations (Newzoo, 2024). Moreover, those with greater financial resources and stability are more likely to invest in virtual commodities and premium functionalities (Smith, Zhao and Tan, 2023). Game publishers must comprehend the demographics and financial capability of their target audience to create successful monetization methods. Furthermore, social influence and peer pressure exert significant influence on the expenditure of mobile gaming (Russoniello, O'Brien and Parks, 2009). The inclusion of in-game social elements, such as leaderboards, multiplayer modes, and virtual communities, fosters a sense of rivalry and social engagement among players (Wang and Zaman, 2019). The social component of mobile gaming might result in heightened expenditure as gamers endeavor to match their peers or attain acknowledgement within the gaming community. In addition, the brain's

reaction, as measured by the motions of the user's eyes and fingers, is an additional determinant of gaming "addiction" for each player, in addition to the aforementioned criteria to eengage in the act of playing (Mathiak and Weber, 2006). The author of the book demonstrates the correlation between the neurophysiology of addiction in gaming and its impact on spending behavior by utilizing neuroscience studies. Ultimately, the discrepancies in mobile gaming expenditures between individuals who spend a lot and those who spend less can be ascribed to several variables. These factors encompass the player's level of involvement, the game's revenue generation approach, the player's demographic and socio-economic characteristics, and societal impact (Johnson and Mayer, 2010). Gaining a comprehensive understanding of these aspects is of utmost importance for game publishers, players, entrepreneurs, and general readers alike. This understanding offers vital insights into the intricate workings and fluctuations of expenditure in the mobile gaming industry. By acknowledging these influences, game producers may devise more focused and efficient monetization tactics, while gamers can make well-informed choices regarding their expenditure patterns in the realm of mobile gaming.

2.2.1 Behavioral economics in mobile gaming

The field of study known as behavioral economics is concerned with the investigation of the psychological and cognitive factors that have an impact on the process of making choices in the field of economics (Li et al., 2012). The purpose of this research is to evaluate the effect that people's behavior and cognitive biases have on the spending patterns that they exhibit when playing games on mobile devices. The objective of this subchapter is to explain the reasons for the disparity in spending patterns among mobile gamers. This is accomplished by analyzing the psychological aspects that drive both high and low spending habits. Loss aversion is a fundamental element of behavioral economics in the realm of mobile gaming (King et al., 2020). Research has demonstrated that people generally prioritize the avoidance of losses over the acquisition of profits (Kahneman and Tversky, 1979). Game developers can exploit this phenomenon by utilizing loot boxes, time-limited promotions, and unique in-game products that induce a fear of being left out (FOMO) (Zendle and Cairns, 2021). Individuals who spend a lot of money, motivated by their anxiety about missing out on desirable

rewards, are more prone to making spontaneous purchases, resulting in significant differences in expenditure. In addition, the subchapter is to examine the influence of social proof in mobile gaming. Humans possess an innate inclination towards social interaction, frequently desiring affirmation from their peers (Cialdini, 2009). Within the gaming community, this is evident via the occurrence of social comparisons and the aspiration to attain elevated status or acknowledgment (Zhang et al., 2017). Game producers can capitalize on this by providing premium features, cosmetic enhancements, or leaderboards that stimulate players' want to distinguish themselves from their peers. Individuals who spend a lot of money, motivated by the need for social recognition, are more likely to make significant investments in these digital assets, hence exacerbating the disparity in expenditure. According to an unconfirmed rumor from the game Call me Emperor (CME), in the early years of the game's launch, the game's developer cleverly "inserted" full-time employees into the game, and turned them into "top players". This means that, in order to stimulate players to spend a lot of money on the game, the CME developer "created" their own "mythical" players, by promoting the brilliant achievements and "King" status of the player designated by CME in the game. Creating a "flashy" appearance has actually worked in calling on players to spend money to gain a kind of "virtual" status in the game. Although this is just an unconfirmed or verified rumor, from an economic perspective, this is entirely possible. Furthermore, the subchapter is to investigate the idea of the sunk cost fallacy from a theoretical perspective. A cognitive bias that is referred to as the sunk cost fallacy is the propensity of people to continue participating in an activity or game even though it does not offer them any pleasure or value (HASHIMOTO and KOYASU, 2012). This is because they have already invested time, effort, or money into the activity or game. Game developers can take advantage of this potential by creating fascinating gameplay loops that encourage players to continually devote time and money to maximize the return on their initial investment. Individuals who spend a substantial amount of money and are persuaded by the sunk cost fallacy are more likely to continue their spending patterns, which results in the maintenance of the various disparities in expenditures that already exist. Through a comprehensive grasp of the fundamentals of behavioral economics in mobile gaming, game producers, entrepreneurs, and players may more proficiently handle the disparity in spending (Zendle et al., 2023). To

explain more clearly, when the author of the article interviewed top players and asked why they spent so much money on CME, the author of the article received the answer: Rich players do not have time to travel but they still need basic entertainment needs. Therefore, instead of spending money on luxurious vacations, or buying branded goods, luxury cars (the items that rich players own), they simply spend money for themselves (or the people they hire), to play games and achieve the "status" they desire in the game. Some people even "seriously" consider spending money on games as their "investment", aiming for the value they receive as their "satisfaction" of spirit and "personal ego".

2.2.2 Cognitive biases and their impact on spending

Cognitive biases are innate cognitive shortcuts or cognitive tendencies that impact our decision-making processes (Gainsbury and Philander, 2019). These biases can significantly influence our perception of value, decision-making process, and ultimately our expenditure. An example of a cognitive bias is the anchoring bias, which occurs when people place an inordinate amount of weight on the first piece of information they are presented with while making decisions (Wang, 2023). The phenomenon of rich people being obsessed with the first cost of in-game transactions may give rise to this bias in the field of mobile gaming. As a result, these individuals may see subsequent purchases as being more sensible and warrantable. In contrast, those who spend less money may be more likely to fiercely adhere to the free-to-play model of the game and have a greater reluctance to make any purchases that require monetary payment. The endowment effect is another cognitive bias that influences expenditure. This cognitive bias causes individuals to attribute greater significance to what they already own, hence increasing their reluctance to leave with it. In the realm of mobile gaming, this phenomenon may be observed as affluent individuals attributing greater importance to the virtual items they have obtained, resulting in increased financial expenditure to improve and safeguard their in-game belongings (Cousijn et al., 2012). Individuals who do not possess this inclination towards virtual goods, known as low spenders, may not assign the same level of importance to these digital possessions and hence spend a lesser amount in total. The scarcity effect is a cognitive bias that contributes to differences in spending patterns. This bias indicates that individuals prefer to assign higher importance to objects or experiences that are seen as few or restricted in number (Cialdini,

2009; Lynn, 1991). In the realm of mobile gaming, this phenomenon may induce individuals who spend large amounts of money to have a compelling need to get exclusive things or engage in time-restricted activities, hence motivating them to increase their monetary expenditure (Hamari, Hanner and Zarnekow, 2017). Individuals who spend less money, who are not influenced by this bias, may be less motivated to spend in these circumstances. This scarcity effect can be better understood when we look at how the upper class spends on luxury items. According to the official list price from Hermès, buyers will need to spend at least $250,000 to $350,000 to own the Hermès Birkin Himalaya Crocodile with diamond color bag. Explaining this price, the Hermès brand itself announced in 2014 that: out of 2 million South American crocodiles, there are only 50 albino crocodiles, and Hermès only produces 1 to 2 Hermès Birkin Himalaya Crocodile with diamond color bags each year. On its official website, Hermès confirmed: because the dyeing of albino crocodile skin takes a lot of time, the waiting list for this product line is very long. It can be said that even if you have money, you still cannot buy a Hermès Birkin Himalayan Crocodile bag. Therefore, owning a Hermès Birkin Himalayan Crocodile bag is considered a manifestation of status, luxury and power among the rich and famous (Băng, 2024). PurseBop founder Monika Arora once called the Hermès Birkin Himalayan Crocodile "the most desired bag in the world" due to the difficulty of purchasing and the high price of the product. Similar to games, this key psychological factor can be used and applied in mobile games. By taking advantage of the "rare is priceless" mentality, game publishers have introduced outstanding features, within a limited time period calculated in minutes, to stimulate the "if you don't buy, you will never have the chance to buy" mentality from wealthy players, and from there, intentionally or unintentionally, "force" players to deposit money (Zendle et al., 2023). To summarize, cognitive biases exert a substantial influence on purchasing patterns within the realm of mobile gaming. By comprehending and resolving these biases, it is feasible to narrow the gap in expenditure between those who spend a lot and those who spend less. This chapter is a wonderful resource for game producers, gamers,

entrepreneurs, and general readers. Its purpose is to unravel the complexity of spending discrepancies in mobile gaming and offer recommendations for a fairer gaming experience.

2.2.3 The impacts of online game to human mentality

Before the arrival of mobile games, scholars have been conducting research on the dependency of gamers on online games and their damaging effects on life. Griffith, Davies, and Chapel found that 80% of players had traded some part of their daily lives to keep playing online games, with 20.8% of adult players neglecting relationships with family, friends, and partners, and 22.7% of non-adult players trading factors such as their works or studies (Griffith et al.,2009). Playing online games can lead to addiction, forming aggressiveness and narcissistic personalities, and lower self-management capacity (Watson, Clark and Tellegen, 1988). Studies have shown that the length of time spent playing online games and symptoms of Internet addiction can lead to mental illnesses such as depression, psychosomatic symptoms, and pain scores (Kim et al, 2008). Several mental illnesses, such as depression, psychosomatic symptoms, and pain scores, are associated with the length of time spent playing online games and the symptoms of Internet addiction (Wei et al, 2012). Additionally, there is a strong correlation between online gaming dependency and somatic pain (Saquib et al, 2017). These findings were documented in several pieces of research. On the other hand, mobile games have positive effects on gamers in both perceptive and cognitive skills. Studies have shown that playing action mobile games for 10 days can improve visual attention, spatial range, and parallel processing skills according to research conducted by Green and Bavelier in 2003. Additionally, It has been suggested that players who play action mobile games have been stimulated to improve attention, spatial cognition, and perceptive faculties (Russoniello, O'Brien, and Parks, 2009). Playing online mobile games during childhood can aid in the development of cooperative, social, and cognitive skills, and can be beneficial for children's intelligence. However, some studies have claimed the importance of video game playing time to people's mental health. Allahverdipour et al. (2010) found that both non-gamers and excessive gamers reported poorer mental health compared to low or moderate players. It is found that playing online games for less than one hour daily would help players with higher life satisfaction and prosocial behavior, while high levels of play were linked to higher internal

and external problems. Through research, both negative and positive impacts of mobile video gaming which is very much dependent on the time spent by gamers playing online mobile games (Przybylski, 2014). For those finding negative effects, the implication has been falling into excessive play, or in other words, playing video games more than three hours a day, while playing at appropriate time may result in beneficial skills enhancements (Valkenburg et al, 2021). Research on the positive and negative effects of video games will directly reflect the impact of movements on the electronic screen on the player's brain, thereby helping to measure the level of "dependence" of players on video games, and thereby creating a persistent and long-term "training" intensity that makes players' dependence on video games increase.

2.2.4 Elements from the game affect the player's psychology

To serve as a basis for measuring the effects of games on players as positive or negative, and also for game manufacturers to improve the quality of their games, and at the same time, improve commercial performance of the game, we need to evaluate the game based on the following factors: amount, content, structure, and context. This will help us have a comprehensive view when evaluating a game or the commercial success factor of a game.

Amount of time playing

This first factor is understood as the amount of time playing the game or how long the player "stays in the game" for the determination of positive or negative effects on the player's side. As scientific research has shown, players spending more than 3 hours a day on the game mostly experience negative effects such as a decline in academic performance, weight gain or obesity, and developing specific negative physical health outcomes (such as carpal tunnel syndrome and other repetitive stress injuries) (Korte, 2020; Gentile et al., 2011). Naturally, due to the author's own experience in playing and joining the game community, this correlation stems from the player's "desire" to release energy or escape their existing "selves". For example, students with poor academic performance, or individuals who experience many failures in life, tend to immerse themselves in online games—especially mobile

games—because of their availability anywhere and anytime. When immersed in the game, these groups experience a sense of "mastery" that they do not have in real life and create a "persona" or another "me" in the game (Yee, 2006; Przybylski et al., 2012). These "personas" represent the personalities or roles that these individuals aspire to embody but are not confident enough to pursue in real life due to environmental and psychological constraints. Consequently, they “sink” into the game world as a form of emotional relief, increasing their daily playing time. Moreover, prolonged gaming sessions reduce time for physical exercise, reinforcing the link between gaming frequency and obesity (Viner et al., 2019). Once a new "persona" is created and internalized in the game, players become less willing to return to the real world, choosing instead to dwell in their idealized in-game identity. Over time, they come to view the game world as their true reality. This escapism, reinforced by extended sedentary behavior, leads to reduced physical activity and basic social interaction, contributing to both physical and mental health problems (Király et al., 2018).

Content

Video games' content can significantly influence players' thoughts and habits, shaping their perception of real-life situations (Murphy et al, 2002). Educational games can improve related skills, while games designed to help children manage chronic health problems are more effective than doctors' pamphlets (Lieberman, 2001). According to research by Gentil et al. (2009), games with violent content can increase aggressive thoughts, feelings, and behaviors, potentially extending into real-life situations. Players' instincts are trained to apply habits in the game, and repeated repetitions can lead them to assume that what they do in the game is normal in real society. New studies according to Jaeggi (2008) focus on the cognitive and behavioral processes of learning and transfer, particularly fluid intelligence, which refers to the ability to reason and solve new problems independently of previously acquired knowledge. A study found that training designed to improve working memory leads to a transfer to fluid intelligence, with the extent of the gain related to the amount of training (Jaeggi, 2008). The content of the game acts as a "direction" from the game producer to the player, shaping the "new personality" of the player in the game world. For this reason, it is not surprising that many game producers spend a huge amount of money to design the background,

costumes, character stories, music and unique instruments in the game. All of these operations are to make the player feel as "real" as possible in the game world, and make them increasingly immersed in a "new world" that they discover.

Structure

A video game's on-screen structure contributes to its effects. In addition, screen touch sensitivity is an important component in the coordination between players and their characters in the game. For example, in the game Call Me Emperor, the prize ranking system is always scored "after the last seconds." The most obvious tactic—widely adopted by players—is to unleash all the resources in the final 10 seconds. Thus, the game's configuration and the sensitivity of the player's device play a critical role in allowing fast, precise actions that affect outcomes (Hilgard, Engelhardt and Bartholow, 2013; Johnson and Mayer, 2010).

Context

Finally, it is confirmed that the social context in the game will directly affect the brain, the player's ability to develop cognitive and personality growth, and their capacity to learn from gameplay (Frost and Eden, 2014; Christou et al., 2013). For example, with games that require teamwork to succeed, players must constantly perform a coordinated set of actions: wearing headphones to communicate, using a mouse or touchscreen to interact, and making decisions in milliseconds—all of which train cognitive flexibility, communication, and response coordination (Green and Bavelier, 2003; Bavelier et al., 2012). Games involving teamwork can improve players' cooperation and coordination skills (Stern et al., 2011). A game's social context may also change cognitive outcomes. In Call Me Emperor, a game set in 19th-century China's imperial court, players impersonate historical roles such as emperors or empresses. While doing so, they are exposed to historical knowledge, ancient poems, and folk music—thus gaining indirect cultural education (Yee, 2006). Players must also read and comprehend narratives tied to Chinese literature and values. This creates both aesthetic and moral value for players, directing them toward cultural appreciation and reflective thinking. Looking at video games from a holistic perspective allows players to "think outside the box"—challenging the binary of "good" vs. "bad" gaming. In fact, different games may yield different

psychological effects, and as such, conflicting research results often reflect variations in design, genre, or player context rather than contradictions in findings (Granic, Lobel and Engels, 2014).

2.2.5 The repercussions impact the player's mental state

Emotional changing

Research on subjective well-being, as well as how and why individuals experience it, is often undertaken from two viewpoints (i.e., emotional responses and cognitive judgement) (Diener, 1984). It is well-established that feelings have a major impact on one's current state of well-being. To put it another way, pleasant emotions, as opposed to negative ones, contribute to an individual's overall feeling of well-being (Hashimatsu and Koyasu, 2012). Many people believe that this notion is appropriate for evaluating well-being in the short term (for example, during a period of a few months). Emotional well-being is the term that is used to describe it in this research (Watson, Clark and Tellegen,1988).

Self-esteem satisfaction

As emphasized in the previous sections on the effects of video games on the brain and regulation of player habits, it is easy to see that, when habits change, players' emotions also change. Thus, finding the answer to the question "Why do players want to play games?" is a configurable measure: the player's level of "happiness" while playing the game. Naturally, it is understandable that the main reason why players feel "happy" when immersed in the game world is the ego impression, or in other words, players have considered the game as a place to play. They "hide" their weaknesses, such as loneliness, disappointment in themselves, fear of themselves in the face of fatigue and pressures in life, psychological avoidance of being judged from the point of view of society and so on (Kuss and Griffiths, 2012; Lemmens et al., 2011). It can be said that, when having immersed themselves in the world of the game, players are free to express their “dreams”, and express themselves in a way that they never or dare to do when they live in their reality. Humorously, "anyone in the game will become a superhero” (González-Bueso et al., 2018).

Personality changes

Through studies, it is confirmed that, when players have considered the game they are playing to become a "real world" that they want to live in, players absolutely have the same "needs" as when they are living in reality, including the needs of "connection", of "conversation", and of course, being "competitive" and “recognized" (Christou et al., 2013; Przybylski et al., 2010). A game that meets these factors will be commercially successful. Standing in the role of the player, their reactions in the game come from both "self-consciousness" and "unconsciousness". Specifically, for these types of role-playing games, and when the player has to play the "character" in the game, all the "strategies" they come up with to compete with other characters, to complete the task in the game, or to "connect" with other characters and players, are accomplished "consciously". When this consciousness appears, they would feel themselves as a "main character", they create their own “community", by making friends on the game, dating on the game, even having career advice on the game and sharing their achievements on the game (Smahel et al., 2008). Thus, the greater their interaction with other in-game players, which means the larger the "community" they build, the more players would see it as an "achievement" that they don't have in their real life, and appreciate that achievement even more. From "conscious" to "unconscious", when all the player's plans "consciously" and "organized" to build their own "empire" in the game, and when things are repeated in a habit, players "unconsciously" use their instincts to decide everything in the game, or in the "world" that they have devoted themselves to building. For example, decisions to buy items or equipment to equip their in-game characters, even though these purchases use real money in their real-life bank accounts (King and Delfabbro, 2019). Naturally, the first time a player recharges a character's equipment, they may think and feel "sorry money". However, when players become more attached to their characters in the game over time, even considering the game’s characters as "themselves", they no longer feel "sorry money", because at that time they think that investing in game characters is investing in themselves. A study launched at the game Call me Emperor with the top 100 strongest players at the Asian Server, studying the spending level of players who accept monthly "investments" to "nurture" their character. Those in the top 10 strongest all have VIP 11 to VIP 15 accounts, equivalent to the amount of money invested

in their characters ranging from $60,000 to $500,000 during their 03 years with the game. In addition, players to stay firmly in the top 100 rankings all hold VIP 9 and VIP 10 accounts, equivalent to an investment of about $30,000. This is a startling number when conducting research. To sum up, it is affirmed that the content and activities in mobile games directly affect the way players perceive the world and shape how their brains react to the world around them. When the environment changes, habits change, and emotions change, a game has a huge impact on changing the player's personality, either positively or negatively depending on the different perceptions of each player (Granic et al., 2014).

2.2.6 Common strategies employed by game publishers to manipulate players' psychology

Visual strategy

Regarding the first strategy when using aesthetic thinking and visual tactics to make players fascinated and caught up in the game, game publishers need to pay attention to the elements of graphics, fashion and music. In other words, the game publisher needs to focus on creating the Non-Player Character (NPC) and the scene of the game. Non-Player Characters play a decisive role and are the incarnation of players for video games (Bartneck, Lyons and Saerbeck, 2017). Usually, NPCs appear as auxiliary characters, allies, to give instructions about the game to the player, and explain the directions and rules of the game. Gradually, through the guidance of NPCs, the player penetrates deeper into the game world, familiarizes themselves with the game's scenario, and performs several quests triggered in the direction led by NPCs. Because of the role of leading and helping players immerse themselves in the game world, modern NPCs tend to be more emotional, more complex, and somewhat more human-like in design (Christou et al., 2013). It must be affirmed that players enter the game from the perspective of NPCs, and over time, consider an NPC as their incarnation. Therefore, making NPCs natural in expressing emotions deepens the player's connection to the game. Creating interactions and similarities between players and NPCs becomes an important factor in increasing player retention (Smahel, Blinka and Ledabyl, 2008). In addition, the combination of fashion, music, and evolving world-building narratives directly influences the player's sensory experience, making them feel

immersed and emotionally attached (Granic, Lobel and Engels, 2014). For example, in the game Call Me Emperor, the NPC representing the player is equipped with numerous outfits (or skins) with diverse styles suited to different personalities. Due to this variety, the NPC becomes more alive, reflecting the player's mood and identity. Naturally, to own these skins, players must spend large sums of money—often over $500 per outfit—creating a strong desire to purchase and thus generating substantial profits for game publishers (King and Delfabbro, 2019).

Figure 8. CME Screenshot: Examples of the beautiful “Skin” (outfit) in CME (Source: by author,2024)

2.2.7 Limb reflex

The second factor that makes the game successful is the combination of players' reflexes on many different device formats. By then, in a game, players can play on mobile, tablet or personal computer. Setting up combinations of "movement keys” on various electronic formats has provided players with the option to practice the game on their own strengths, and use this to win the game competitions. It must be affirmed that the hand movements contribute a prerequisite to stimulate the player's brain to constantly move and make important decisions of the game, including the decision to buy in application, because therefore, the fact that the game maker wisely designed the smart hand movement to control the NPC is a prerequisite for players to depend on the game (Cai, 2009). For example, in the same game, players have the choice to experience using their fingers to control the character on the phone, or using the mouse to control the character on the computer will create a

different experience, above all, Players can choose their strengths to join the game. As such, it is a direct way for game manufacturers to increase game downloads from players on different devices and different interfaces.

2.2.8 Create a sense of “achievement” for players

Humans tend to stick to something that gives us a sense of "achievement," from work to romantic relationships, or most simply, achievement in a game (Lin et al., 2015). With commercial games, when the competitive environment between players is very large, the manufacturer can break down each milestone of the task, so that the player slowly completes the small tasks, and then completes the larger mission of the game. Producers need to separate between “individual missions", where tasks are completed by the player's individual, by the player using his or her abilities. The big tasks in the game would be completed in the form of a "team", that is, using the backend and the support from many team members who are close to the player. This is a guaranteed way for players to achieve achievement regardless of whether they are playing in groups or playing alone, and just having achievements would give the player a sense of dependence on the game.

Figure 9. Screenshot of CME: To win in-game competitions, players need to spend a lot of money to "equip" auxiliary gear to be able to achieve "dominant" rank at their serve (Source: by author,2024)

2.2.9 Socioeconomic factors influencing gaming expenditure

The fundamental basis for spending in mobile gaming is centered on the notion of status and social approval. For many individuals, investing money in in-game transactions offers a way to display their accomplishments, improve their gaming experience, and get acknowledgment from their peers (Lin et al., 2015). These gamers are motivated by the aspiration to be seen as successful or superior within the gaming community, leading them to invest on products such as unique skins, powerful weapons, or exclusive avatars. The social acknowledgement and reinforcement they receive become essential aspects of their gaming identities and significantly influence their propensity to spend money (King, Delfabbro and Gainsbury, 2020). The psychological incentives behind spending in mobile gaming are intricately connected to the notion of reward and enjoyment. Mobile games are meticulously crafted to elicit emotions of exhilaration, contentment, and triumph by employing diverse game mechanisms, such as advancing to higher levels, attaining achievements, or hitting significant milestones. Individuals who spend a significant amount of money are more vulnerable to these psychological stimuli, as they need immediate satisfaction and a feeling of advancement within the game (Brand et al., 2019). In-game purchases provide a convenient way to obtain these incentives, enabling players to circumvent the time and effort needed to acquire them naturally. It can be seen that hitting the "competitive mentality" of players, when seeing other players achieve achievements, and wanting to achieve the same achievements in the game is considered a useful strategy for game publishers in attracting and stimulating players to deposit money. Of course, it is obvious that, in the virtual world environment, the competitive mentality of players is further promoted, because with the concept of "what cannot be achieved in real life, they can achieve in the game" will stimulate players to find every way to win. And, when given a choice: they want to win and they have to deposit money, players are more likely to choose to deposit money to ensure their victory. Furthermore, the fear of missing out (FOMO) might serve as a psychological incentive for buying. Game producers frequently utilize time-limited promotions, exclusive events, and awards with expiration dates to exploit players' apprehension of falling behind or being excluded. The apprehension of not wanting to lose out on distinctive experiences or important in-game products compels gamers to make hasty purchases, sometimes without taking into account the potential long-term

repercussions. Gaining insight into the social and psychological factors that drive differences in purchasing habits between high and low-spenders in mobile gaming is essential for game producers, players, entrepreneurs, and general readers alike (Drummond et al., 2020). Ultimately, social and psychological factors exert a substantial influence on expenditure patterns in the realm of mobile gaming. By exploring these reasons in greater depth, we may unravel the disparity in spending habits between individuals who spend a lot and those who spend less. This results in a more thorough comprehension of the mobile gaming industry and its consequences for the various parties involved.

2.3 The effects of playing online games to social connections

Playing online games can be popular for creating very huge "communities" which have been defined as "neighborhoods that have a sense of communities' (Blanchard,2004). Due to McMillian and Chavis, a sense of community can be composed of feelings of memberships, the need to influence others, together with sharing emotional connections (McMillian and Chavis, 1986). In the online world, Blanchard and Markus has defined the virtual sense of community as the composition of exchanging support, creating self-identities in the game world and making the "friendship" or "relationship" as the production of trust. By the way, the virtual world has become the game players' second life, where players can meet their "colleagues" for verbal communication, playing games within the communities, finding the opponents to compete with, creating a lot of dramatic stories while fighting for the title in games (Blanchard and Markus, 2004). With the daily routine to play the game with a specific time zone, the game creates the new habit for players which make them interact regularly with their game community to express the "another version of themselves". At the time when their real life cannot "feed" players what they want, to find another "world" with a virtual environment has been a way to let players hide their true-self and create the better version of themselves. Moreover, for many players who are living under pressure and fast- pace oriented space, playing online games as CME can be a very effective way to "date" or find their real love. There has been some function of match- meeting in games to let players find out about each other and then, gradually talk without game context, but more on personal life sharing. Day by day

and time by time, when players have been playing CME for years, their bond can be increased which leads to real-life meetings or further engagements or commitments. Hence, it can be seen that game publishers, such as the game CME, have especially understood the feeling of "loneliness and isolation" in the real world of players, along with the need for "social connection" of players, to cleverly integrate fairy scenes, and at the same time lead them into the game, where players can do whatever, they want. This is indeed an extremely useful and effective psychological "hypnosis" trick, when a game combines many features, and as long as the player needs it, the game will provide it.

2.4 Neurophysiology of addiction in gaming and its relation to spending behavior

2.4.1 Understanding addiction in gaming

The study of the neural mechanisms behind addiction in gaming is crucial for comprehending the actions and drives of gamers. The addictive aspect of gaming is mostly attributed to the brain's reward system, which is predominantly influenced by the release of dopamine (Arias-Carrión et al., 2010). When gamers reach significant achievements, get scarce objects, or excel in competitive games, dopamine floods their brains, generating a feeling of joy and strengthening the motivation to keep playing. The neurochemical reaction can result in addictive behaviors, as players become more motivated to get larger rewards, frequently at the cost of their financial resources.The brain's reward system is the central component of this comprehension of addiction. The substance's use initiates the release of the neurotransmitter dopamine, which in turn affects neurones in the nucleus accumbens and other brain regions, including the prefrontal cortex (Zastrow, 2017). The classic symptom of craving is produced when these complex circuits are repeatedly activated, resulting in the modification of neural connections until they respond to the mere anticipation of the reward, as in Pavlovian conditioning. The sense of euphoria can be diminished and tolerance can be produced as a result of the changes in dopamine receptors and the functioning of these pathways over time. Simultaneously, dopamine exposure creates modifications in other brain regions, including the amygdala (Volkow et al., 2006). This can result in an increase in negative emotions, including stress and fear, in the absence of the drug, prompting addicts to seek the drug in order to alleviate the discomfort of withdrawal. According to Nora

Volkow, director of the National Institute on Drug Abuse, these modifications in neural circuitry that are the result of drug use are persistent and contribute to the high rate of relapse among addicts. The way this works in video games is very similar to gambling addiction, with the intermittency of the reward only heightens its conditioning power (Fauth-Bühler and Mann, 2017). It can be seen that, when playing a game, the player is in a situation where he does not know when he can be killed or when he can destroy the enemy, or find the treasure or reward that the game offers. However, when the player achieves this goal, the dopamine level increases and makes you more and more committed to the game. We can take the typical example of the game "Candy Crush", a mobile game published by Activision Blizzard, in which the simple task given is: the player tries to arrange colorful candies in rows and columns, and according to the rule, when arranging enough rows of the same color, the candy will suddenly disappear with a bell and a new batch of candies will appear. It can be said that it is the bell and visual surprise that makes the player familiar with the sound, and strengthens the player's dependence on the game. Therefore, when the player's instinct is "trained" by repetition every day, the player's dependence on the game will increase. Neuroeconomic studies have yielded useful insights into the psychological factors underlying both excessive and minimal expenditure in gaming. Personality characteristics, cognitive biases, and social influences are contributing factors to variations in individual spending behavior. Individuals with a greater inclination towards risk-taking are more likely to spend bigger amounts of money on in-game purchases, driven by the need for the excitement of unpredictability (Mohammadi et al., 2020). Moreover, cognitive biases, such as the endowment effect or the sunk cost fallacy, might impact players' decision to invest more money in a game due to their emotional attachment to virtual items or their desire to recover perceived losses.

2.4.2 Definition and types of addiction

To comprehend the neuroeconomic aspects of gaming expenditure, it is essential to initially build a precise definition of addiction and its many classifications. Addiction is a multifaceted phenomenon characterized by an irresistible involvement with a drug, activity, or behavior, even in the face of adverse outcomes. When addressing gaming addiction, it is crucial to distinguish between chemical addictions and behavioral addictions

(Alavi et al., 2012). Substance addictions pertain to the improper use of drugs or alcohol, whereas behavioral addictions, like gaming addiction, center around excessive involvement in a certain activity. Gaming addiction, or online gaming disorder (IGD), is marked by an excessive and obsessive engagement in gaming activities that result in significant impairment in several areas of an individual's life. Individuals afflicted with gaming addiction frequently encounter withdrawal symptoms, a lack of self-regulation, and an obsession with gaming that impairs their everyday activities and interpersonal connections. Gaming addiction may be categorised into many forms based on the specific components of gaming to which individuals develop an addiction (D Griffiths, 2014). As an illustration, certain persons may develop a dependency on massively multiplayer online role-playing games (MMORPGs), wherein they become deeply absorbed in the virtual realm, creating characters and doing missions. Some individuals may develop a dependency on competitive online multiplayer games when the aspiration to succeed and enhance their abilities becomes overwhelming (Achterbosch et al., 2008). Neurophysiology is essential for comprehending addiction, especially gaming addiction. Research has demonstrated that frequent exposure to gaming stimulates the reward system in the brain, resulting in the release of dopamine, a neurotransmitter linked to feelings of pleasure and motivation. The release of dopamine generates a delightful experience that individuals want to reproduce, resulting in the formation of addictive behaviors. Neuroeconomic studies have explored the underlying psychological processes that contribute to both excessive and little expenditure in gaming. Studies have revealed that some individuals are more inclined to participate in excessive spending activities as a result of their personality characteristics, such as impulsiveness and a need for novel experiences (Dennison et al., 2022). These individuals are prone to making impulsive purchases within the game or participating in loot box mechanisms, leading to increased expenditure. Conversely, persons who exhibit modest spending tendencies may have elevated levels of self-discipline and a more logical approach to their expenditures on gaming (Karim and Chaudhri, 2012). They could exhibit a heightened sense of caution and discernment while making purchases, prioritizing the game's worth and practicality above impulsive cravings.

2.4.3 The role of dopamine in gaming addiction

Over the past few years, gaming addiction has emerged as a prominent problem, drawing the interest of game developers, gamers, and leaders in various fields. As we further explore the neuroeconomic aspects that influence spending on gaming, one significant contributor becomes apparent: dopamine. Dopamine, a neurotransmitter in the brain, has traditionally been linked to feelings of pleasure and the anticipation of rewards (Han DH et al.,2007). It has a crucial impact on our motivation, reinforcement, and learning mechanisms. Within the realm of gaming addiction, dopamine plays a crucial role by intensifying the pleasant sensations linked to playing games and motivating individuals to partake in excessive and compulsive gaming activities. By understanding the brain's dopamine release mechanism, we have come to understand that commercially successful games aim to stimulate more dopamine release. The surge of dopamine can establish a potent cycle of reinforcement, resulting in a want for further gaming and eventually influencing expenditure patterns. In line with this argument, Yee summarized and accurately divided the motivations that make players "addicted" to games including "achievement", "social" and "immersion" (Yee, 2006).

Factors Contributing to Gaming Success and Engagement

Many different factors help explain why games are so good at capturing players' attention and keeping them engaged, and these factors span across psychological, social, and even biological levels. On the psychological side, one major appeal is the feeling of progression. Players are drawn to leveling up, earning rewards, and building up virtual wealth or status, which gives them a sense of power and accomplishment (Yee, 2006). Game mechanics also play a huge part. For some players, there's a strong desire to understand how the system works behind the scenes — the rules, the logic — so they can master it and perform better (Hamari and Tuunanen, 2014). And of course, competition is another big motivator. Being able to test your skills against others, be recognized, and prove yourself in a challenge can be deeply satisfying (Przybylski et al., 2010).But success and competition aren't the only reasons people play. Social factors are just as important. Games give people the chance to connect — chatting, working together, or just spending time in a shared virtual space. For many, it's about forming relationships, even friendships

that last beyond the game (Ducheneaut and Moore, 2005). Teamwork adds another layer, offering players the rewarding experience of being part of something bigger — a coordinated effort where everyone contributes and shares success (Johnson et al., 2015). Then there's immersion — the feeling of being pulled into another world. Exploration lets players uncover secrets, solve mysteries, and lose themselves in a narrative or setting. Role-playing offers something even more personal: the chance to craft a character that reflects who they are or who they want to be. In that world, they can interact, express themselves, and make choices they might not make in real life. Being able to customize a character and shape the environment strengthens that sense of connection and ownership (Turkay and Adinolf, 2012). And for many people, gaming is a form of escape. It provides a break from everyday stress, negative emotions, or even just boredom — a place to breathe and be someone else for a while (Kowert and Quandt, 2016). On a biological level, research shows that games actually affect our brains. Playing — especially when you win, level up, or hit a goal — triggers the release of dopamine, a chemical linked to pleasure and reward. That little rush of satisfaction creates a feedback loop: the more rewarding the experience, the more you want to keep going. Over time, it becomes a cycle — you crave that feeling, you play to get it, and you keep playing in search of the next high point (Wadsley et al., 2021). The correlation between dopamine and gaming expenditure becomes apparent when we examine the psychological factors underlying both excessive and minimal spending in the realm of gaming (Beeler et al., 2012). Research has indicated that persons with elevated levels of dopamine receptors demonstrate a greater propensity for indulging in extravagant expenditures on in-game purchases, subscriptions, or virtual items. The increased dopamine reaction amplifies the enjoyment obtained from obtaining these virtual incentives, resulting in impulsive and occasionally foolish financial choices. Gaming addiction has been discovered to have resemblances to other types of addiction, such as substance misuse (Walther et al., 2012). The propensity for addiction to gaming might also influence one's financial habits(Ong et al., 2016). Studies have demonstrated that those who have a gaming addiction are more prone to engaging in impulsive and extravagant spending on in-game transactions. The observed association indicates that the neurophysiological mechanisms that contribute to addiction may impact the way individuals in the gaming community spend their money. One common

tactic for game developers is to promote free game downloads and in-game purchases. This can be considered an effective "psychological bait" from game developers to players. Kuss and Griffiths (2012) also reported that games are accessible and inexpensive, and can be played at home, work, or while riding a transport. Numerous activities are accessible for free. Conversely, persons with diminished dopamine receptor levels may demonstrate greater self-discipline and moderation in their expenditures on gaming (Kühn et al., 2011). Due to their diminished responsiveness to the pleasurable effects of dopamine, individuals may exhibit decreased susceptibility to the appeal of in-game purchases or the want to pursue heightened gaming experiences. Consequently, they are likely to have more restrained spending habits.

2.4.4 The impact of video game on human brain

Video games have had a significant and transformative influence on several elements of people's life, including their leisure activities, as well as other areas, throughout the past four decades (Yeh et al., 2001; Zyda, 2005; Boyle et al., 2012). Contrary to common perception, the gaming industry does not primarily target male children or teenagers. The average player is actually 30 years old, and the gaming population is evenly split between males and females. Therefore, gaming is a regular activity for a significant portion of the adult population (Jansz, 2005). Video games are currently widely available, cost-effective, and highly popular sources of entertainment. They are expected to become increasingly important in various fields, including mental health (Granic et al., 2014; Jones et al., 2014). Prior research on computer games primarily examined the adverse effects of playing digital games, specifically the influence of violent entertainment games on aggression (Ferguson, 2007) and addiction (e.g., Gentile, 2009). However, over time, scientific investigations have also acknowledged the potential beneficial effects of video games on individuals' well-being (e.g., Anderson et al., 2010; Jiao, Tang and Wang 2022). While numerous comprehensive reviews and meta-analyses have examined the impact of video game training on improving overall well-being, the majority of these studies have explicitly concentrated on the impacts of digital games on brain plasticity or cognitive decline in children and seniors. In contrast, there is just one meta-analysis that specifically focuses on the adult population. This analysis is limited to studying the impact of training with a specific genre of

games (action video games) on the cognitive abilities of healthy people. Over the past few decades, the computer gaming industry has been moving towards more serious applications. Both commercial and non-commercial video games, specifically designed by academics to train individuals' skills, have been subject to numerous studies. In 1987, researchers discovered that popular commercial video games such as Donkey Kong and Pac-Man can enhance cognitive abilities, specifically enhancing the reaction times of older adults (Clark et al., 1987). In 1989, Space Fortress, the initial non-commercial computer game developed by cognitive psychologists as a teaching and research instrument (Donchin, 1989), gained significant recognition for its success and was subsequently incorporated into the training curriculum of the Israeli Air Force. Since then, a multitude of video games have been created with the explicit intention of altering behavior patterns. These games are commonly referred to as "serious games" in literature, as they employ gaming elements as the main means to achieve serious objectives. Following these groundbreaking experiments, numerous researchers have explored the possibilities of various video games, including both commercial and non-commercial ones, mostly in relation to the cognitive abilities of older adults. Research has shown that elderly persons can improve their cognitive flexibility by playing complicated strategy video games (Stern et al., 2011). Moreover, engaging in a commercial computer cognitive training program leads to notable enhancements in visuospatial working memory, visuospatial learning, and focused attention among older persons who are in good health (Peretz et al., 2011). In addition to their cognitive training benefits, multiple studies have shown that video games can create positive emotional experiences. These experiences can be particularly useful for developing emotional skills, such as self-regulation habits. For example, puzzle video games like Tetris, which have modest cognitive demands and short time limits, might have a good impact on players' mood. They can generate positive emotions and induce relaxation (Russoniello et al., 2009). Moreover, video games require players to constantly face new challenges, such as transitioning between levels in games like Portal 2 or switching between different avatars in games like World of Warcraft. This demands players to "unlearn" their previous strategies and effectively adept to new systems without feeling frustrated or anxious (Granic et al., 2014). While many comprehensive reviews and meta-analyses have examined the impact of video game training on improving

individuals' well-being, particularly in terms of cognitive and emotional enhancement, the majority of these studies have specifically concentrated on the effects of digital games on brain plasticity or cognitive decline in children and seniors. Both behavioral research (e.g., Baniqued et al., 2014) and meta-analytic studies (Toril et al., 2014) have shown consistent evidence of a favorable correlation between video game training and improvements in cognitive skills for both populations mentioned. In contrast, there is only one meta-analysis that specifically studied the effects of training with action video games on cognitive skills in healthy people (Wang et al., 2016). Although there is a lack of emphasis on the adult population, this group is highly intriguing and distinct, possessing distinct neurological and psychological traits when compared to children and the elderly. According to Finch (2009), the adult stage of life, which encompasses both young adults (18–35 years old) and middle-aged adults (35–55 years old), is crucial in the study of life-span development and merits careful examination (Finch, 2009). The impacts of the inverted U curve of neuroplasticity and cognitive function become apparent during adulthood, particularly in middle age (Cao et al., 2014; Zhang et al., 2015). Conversely, it is widely recognized that adults experience a significant degree of psychological stress, which can lead to significant mental and physical health problems (Kudielka et al., 2004). In addition, according to the literature, age differences can influence the effectiveness of training (Jaeggi et al., 2011; Von Der Heiden et al. 2019). While it is generally accepted that video games can have positive effects when used in training (e.g., Baniqued et al., 2014; Toril et al., 2014), it is important to consider that these effects may vary depending on age- specific factors (Wang, 2017). In this review, we would discuss recent experimental investigations completed from 2012 to 2017. The objective is to find scientific data about the effects of video game training on cognitive and emotional skills in adults. The study conducted a comprehensive analysis of various factors related to the research topic, video games, and training outcomes. This analysis was based on significant previous studies (Connolly et al., 2012; King et al.,2020; Bavelier et al., 2011), which offered a valuable structure for organizing the research based on key variables. Furthermore, based on the author's extensive investigation of neuroscience in the previous "literature review," the research piece aims to underscore the beneficial impact of games on the brain. Elucidates the neurological response of the brain when individuals become "addicted"

to video games. The writer aims to derive a "universal equation" that game publishers might employ to achieve commercial success in game development. The author's purpose is to reaffirm the role of video games and mobile games in life. In order to aim for creating commercially successful games, the first thing the author wants to affirm is to remove people's "prejudices" about playing games. By affirming the benefits of mobile games and video games for people's spiritual lives, and at the same time, through neuroscience studies on the effects of mobile games on the human brain, the author's research will create a premise for us to proactively control our gaming, in order to minimize the negative effects of mobile games, and at the same time make the most of the benefits that mobile games can bring to us in our daily lives.

2.4.5 Social perception of video games

The mainstream media is filled with articles discussing the impact of video and computer games on the brain. The exaggerated headlines asserting that video games either harm or enhance brain function fail to accurately represent the intricacies and constraints of the studies conducted, leading to a perplexing portrayal of the impact of gaming on the brain. In this article, six specialists in the field provide insights into the present comprehension of the cognitive and behavioral impacts of playing video games, both positive and bad. They also discuss the potential utilization of this information for educational and rehabilitative reasons. Given the nascent stage of study in this domain, the authors of this Viewpoint also analyze many concerns and obstacles that need to be resolved to advance the subject (Király et al. 2018). The prevailing perception that is limited in perspective has led to biases toward engaging in video games, as well as fostering an unsympathetic attitude towards gaming among many individuals. The article has researched the beneficial impact of video games on cognitive function and has also provided insights on how to effectively utilize video games to enhance one’s well-being. Enhance consciousness and instruction. By doing so, a lucrative game model can be established for game publishers (Choi, E. et al., 2020). While the media often sensationalize the impact (or lack thereof) of video games, it is important to recognize that the word ‘video games' encompasses a wide range of constructs and so lacks scientific predictability (Bavelier et al., 2011). The impacts of video games, much like the effects of food, are difficult to determine definitively. There exists a vast

multitude of individual games, encompassing numerous diverse genres and sub-genres, and they can be enjoyed on various platforms such as computers, consoles, hand-held devices, and mobile phones. To put it succinctly, understanding the consequences of video games requires a careful examination of the specific specifics. Research on 'action' video games has shown that playing these games can improve cognitive skills, visual perception, focus, and statistical reasoning. This is not just due to the inherent perceptual abilities of those who play games, but also has practical implications, such as restoring visual capacities in patients with amblyopia and training surgeons. However, several research questions need to be addressed, including the positive impacts of mobile games on human brain function and behavior, how to categorize constraints to facilitate their detection and modeling, current practices and research achievements in popularizing games and resolving constraints in the industry, and how to integrate existing information on constraint classification and efforts to encourage players to purchase in games into a comprehensive framework for managing constraints and developing a factor to trigger players to make payments for popular commercial games.

2.5 Approach in gaming research: neuroeconomic investigations of the psychological mechanisms behind spending in gaming

2.5.1 The impact from limb to brain

Neuroeconomic study also focuses on examining the psychological factors that underlie both excessive and little expenditure in gaming. Researchers have identified specific brain areas and cognitive processes involved in economic decision-making using neutron imaging techniques such as functional magnetic resonance imaging (fMRI) and electroencephalography (EEG) (Meng et al., 2014). Studies have demonstrated that individuals with elevated levels of self-control display increased activity in the prefrontal cortex, a region linked to impulse control and long-term planning. When it comes to the construction and maintenance of coherent mental representations of the human body, the somatosensory system is an instrument that is absolutely essential (Tamè and Longo, 2023). The fundamentals of somatotopic and hierarchical organization of the primary somatosensory cortex and the motor cortex have been crucial in the development of conventional ideas of

somatosensorial. Emerging research, on the other hand, has demonstrated that these principles do not adequately capture the perceptual and brain representations of touch. According to another research of (Haggard et al, 2005), through the utilization of a spatial body schema, the brain retains a record of the shifting placements of various body components in space. For the purpose of locating a tactile stimulus on the skin, participants may either make use of a somatotopic body map or a body schema in order to determine the location of the stimulation in relation to the surrounding environment. Subjects who were in good health were touched on the fingertips while their hands were in one of two positions: either the right hand was placed vertically above the left hand, or the fingers of both hands were intertwined. For the purpose of identifying either the finger or the hand that was touched, the subjects provided verbal responses in a hurried manner. The interweaving of the fingers appeared to have a considerable impact on hand recognition across a number of experiments, while it had no impact whatsoever on finger identification. The findings of this study indicate that the process of identifying fingers takes place within a somatotopic representation, also known as a finger schema. When identifying hands, a generic body schema is utilized, and the exterior spatial location plays a role in the identification process. After going through the process of allocating fingers to hands, this dissociation suggests that it is only possible to identify finger contacts with a certain hand after the process has been completed. Similarly, the hypothesis that the author of the study put forth is that: gamers feel more and more "addicted" and dependent on the game as their interactions and finger reflexes with the phone screen become larger. That means: to increase gamers' dependence on the game, game manufacturers need to think of ways to increase the contact ratio between the player's fingers and the phone screen as much as possible.

2.5.2 Psychological mechanism behind spending in gaming

Neuroeconomic research has shed light on the psychological mechanisms that explain why certain players tend to spend less money in games. One of the key factors is self-control. Individuals with higher levels of self-discipline are more likely to resist impulsive spending, especially when faced with time-limited or emotionally appealing in-game promotions (Hofmann, Friese and Strack, 2009). Understanding how self-control can be strengthened or leveraged may help game designers develop strategies that support more mindful and sustainable

spending behaviors. Another important psychological mechanism is intrinsic motivation. Some players derive enjoyment from progressing through challenges or achieving in-game goals for their own sake, without the need for external rewards. These individuals are typically less inclined to spend real money, as they find satisfaction in the experience itself (Ryan, Rigby and Przybylski, 2006). This highlights the need for game publishers to design experiences that are deeply engaging on their own, encouraging commitment without over-relying on monetization incentives. Risk aversion is also a relevant factor. Players who are naturally more cautious or reluctant to gamble with uncertain outcomes tend to avoid spending real-world money on microtransactions or random reward systems such as loot boxes (Trepte, Reinecke and Juechems, 2012). Instead, they prefer to progress using in-game resources they earn through effort. For this group, game developers can offer alternative advancement paths that don't rely solely on real-money purchases, such as grinding systems or achievement-based unlockables. In many cases, financial reality plays a decisive role. A significant portion of players who refuse to spend money in games are fully aware of their own financial limitations. These individuals often fall into a specific demographic: over 40 years old, juggling multiple part-time jobs, lacking a stable full-time income, or having little to no savings. Many turn to gaming not as a luxury, but as a form of escapism — a refuge from social dissatisfaction or life fatigue (Griffiths et al., 2017). While they may wish to invest in the game, their bank accounts tell a different story. This awareness of limited means leads them to engage more deeply with the game mechanics, completing more quests, accumulating points, and exchanging in-game currency for items as a substitute for direct spending. Ironically, their economic constraint often results in stronger in-game engagement and participation, as they work harder to earn what others might simply buy.

2.6 The game model is easy to popularize

After the neuroscience research above, the author of this thesis can make a relation due to the author own experience to create a metaphor for the readers easily to understand that a person who becomes "addicted" to a mobile game will have to go through the same process as when they are "in love": initially, there is a feeling of "curiosity and interest" (through integrated signals from the eyes and the coordination of the fingers that stimulate and transmit signals to the brain and let the brain perceive the "interesting feeling"), then gradually the game players will feel

"familiar" with the game (when they have played in the game for about 3 months and have gradually discovered the game's features) and finally reach at the next stage, when the game becomes a "habit" of the player. It means when they have played the game for a long time, the brain will note the "necessity" of the game and consider the game to become a part of the player's daily schedule. This is the time when players are "addicted to the game" and cannot stop. By then, first creating an initial feeling of novelty, game publishers cleverly "educate" players along the game's roadmap and gradually make players "obsessed" with the thought of what they have become a part of the game and at this point, the "obsession" will make the player constantly have the desire to "show a different version of themselves" and stay in the game. Thus, we realize that the most popular mobile games that attract the most players will usually be synthesized by the following factors creating a sense of stimulation from the movement of the fingers and the movement of the eyeballs stimulates the brain. To do this, many game publishers have spent a lot of money investing in upgrading the graphics, perspective and costumes of the game characters, and even composing their own unique music for the game (this is certainly the case with the game "Call me Emperor" (CME) and Genshin Impact). As a result, through visual and auditory appeal, game makers have successfully led players into the game. However, not all game publishers have huge amounts of investment like CME or Genshin Impact. Therefore, many developers, who code and create their own games, have followed the second path: coding a game with an extremely simple interface and focusing directly on interaction and coordination of fingers. This is especially true with the success of "Flappy Bird" by developer Dong Nguyen, whom I had the opportunity to meet and interview. In the game Flappy Bird, the goal is to lead a character that resembles a bird through a succession of difficult obstacles. The game was released to the public in May 2013. When the mobile game Flappy Bird was first release, it gained a lot of popularity and was criticized for being extremely challenging by many. Dong Nguyen, the game's inventor, took it off cellphones in 2014 due to excessive addiction. The objective of the game is straightforward: the player must direct a bird through the spaces between regularly spaced pipes by either doing nothing, in which case the bird descends, or pressing the "up" key, in which case the bird jumps upward. However, because of the quick game dynamics,

significant environment diversity, and large search space, the scores obtained are typically poor. In order to build a computer program that can solve the game's puzzle, precise feature specifications are necessary.

2.7 The intention of the author of the dissertation

The study of the influence of video games on the brain, emotions and personality formation of players is an important thing to answer the question: Why are players attracted to games? Answering this question, new game publishers are fully capable of creating a game that fully meets the desires of players, and thereby reap huge profits. This study surveyed role-playing game users and war-strategy gamer users to identify factors that affect intent to purchase virtual goods in online games. Study results show that game type is a moderating variable for character competency, price utility, and social relationship support. Online game suppliers can use study results to improve online games and increase income from online games. Thus far, the reviewed literature has shown consistent findings that highlight the similarities between the brain mechanisms underlying IGD and substance use disorder. The evidence that has been reviewed thus far points to structural changes and modified reward and seeking functional pathways in IGD, which bear similarities to drug use disorders and support the behavioral addiction hypothesis of IGD. According to the behavioral addiction model, IGD exhibits symptoms of withdrawal and excessive use despite negative effects. The value of my research lies in the fact that the author can compare 03 typical game lines targeting 02 different markets: the market of the rich and the super- rich, when they need to constantly top up to keep their rankings on the game, and commercial markets where anyone can download and play games. "Call me Emperors" (CME) is a game aimed at the market of the rich and super-rich, when high-ranking players (top 10 and above) all spend money, which is expected to be at least $300,000 USD each player according to the publisher's announcement, while "Flappy Bird" and "Genshin Impact" are both game series that are easy to commercialize when suitable for "normal" players. The author of the article had the opportunity to directly interview these wealthy players to find out the reason: Why are they willing to deposit so much money into CME to "invest" in the characters in the game? Thereby, the author of this study researched and used neuroscience to understand the mechanism of action and reaction of the brain in response to the game and the self-hypnosis mechanism of the brain on player behavior.

Currently, there is no research that has had the opportunity to reach out to the super rich, and use neurological research to explain the phenomenon of "gaming addiction" among players. The author of the article will apply this mechanism to help game publishers understand how to create a "billion dollar" game.

CHAPTER III: THEORETICAL FRAMEWORK

3.1 Research methodology and data collection

This study takes a mixed-methods approach to explore the differences in spending behavior between high and low spenders in mobile gaming. The goal is simple: figure out what drives players to spend money and how to design a game that maximizes engagement and revenue. To get a well-rounded picture, both qualitative and quantitative methods were used.

Who we talked to & why

To make sure we had a solid understanding of the market, we reached out to:

- 20 industry professionals (publishers, marketing experts, and analysts) to get insights on trends and strategies.
- 10 game developers and designers to understand the creative and technical aspects of monetization.
- 145 mobile gamers to learn directly from those who experience in-game spending firsthand.
- A large-scale survey with 560 mobile gamers from different backgrounds to provide broad, quantitative data.

The survey covered a wide demographic range:

- Age: 18-45 years old.
- Gender: 52% male, 48% female.
- Geography: Players from North America, Europe, and Asia to get a global perspective.

Crunching the numbers: statistical analysis

This study employs Excel to perform regression analysis, aiming to evaluate independent variables and assess their impact on factors that shape the expectations of personalized travelers in the context of cultural tourism. Data collection involved bilingual interviews and questionnaires administered in both Vietnamese and English, with all interview responses translated into English for consistency in analysis. The findings were presented through tables

and charts, and key conclusions were drawn from participants' responses. The core objective of the research is to explore the determinants of traveler happiness during cultural tourism experiences.

Digging deeper: interview insights (as a group discussion)

Interviews were conducted by creating a workshop with 20 industry professionals, 10 game developers, and 145 gamers to go beyond the numbers and understand the psychology behind spending. We asked questions like:

What makes you decide to spend money in a game?

What kind of game features make you more likely to spend?

Do you see patterns in your own spending habits?

We analyzed the responses using thematic analysis, breaking down answers into categories and spotting trends. To ensure accuracy, two researchers independently reviewed the transcripts and compared their findings.

Making sure the findings hold up

To strengthen the study's reliability, we cross-checked findings through triangulation—comparing survey data, interview responses, and existing research. This ensured we weren't just seeing random trends but real, meaningful patterns.

3.2 Research design and participant selection criteria

This study looks at how mobile strategy games, particularly Call Me Emperor (CME), influence player interactions, alliances, and even real-world behaviors. The game is a prime example of integrating multiple mini-games to keep players engaged and encourage spending.

Who we studied & why

To understand spending behavior, we categorized players into four groups:

Non-spenders (players who don't recharge in-game).

Low spenders (spending less than $200 per month).

Moderate spenders ($500-$1000 per month).

High spenders (above $2000 per month).

Data was gathered from surveys conducted on CME's official Facebook Fan page, ensuring responses from active, engaged players. To dive deeper, we conducted interviews with the top 50 biggest spenders to uncover what drives heavy spending behavior.

3.3 Data collection procedures

To get a complete picture, we collected data through:

- Surveys (560 responses from gamers worldwide).
- Interviews by creating a workshop and webinars (industry professionals, game developers, and top spenders).
- Observational studies within our own organization to see spending behavior in action.

How we analyzed the data

The research process followed a structured approach:

Identifying constraints: Categorizing factors that influence spending behavior.

Reviewing industry models: Looking at how other games successfully monetize players.

Developing and testing a mobile game: To apply theoretical findings in a real-world scenario.

The researcher personally coded a mobile game and tested it within their own company, focusing on two main goals:

Using neuroscience principles to enhance player engagement and encourage spending.

Incorporating gamified English vocabulary learning, making players improve their language skills while playing.

3.4 Cross comparison of game titles on the market

To understand what works, we compared CME with other successful titles, particularly Genshin Impact, which has generated over $3 billion in revenue. While both games operate in the role-playing space, Genshin Impact's monetization model differs significantly, offering a valuable case study.

Key takeaways on monetization

- Survey insights: What makes players more likely to spend?
- Interview analysis: How do top spenders make their purchasing decisions?
- Game version comparisons: Examining CME's versions from 2021-2023 to identify the most successful features.

The study ultimately presents a commercial game model that integrates neuroscience-based engagement techniques and educational elements, aiming to maximize both player retention and revenue.

3.5 Research hypothesis

H1: The behavioural intention to engage in spending money on games that are tailored to specific cultural communities is positively impacted by game expectations.

H2: The behavioural intention to engage in spending money on games that are tailored to specific cultural communities is positively impacted by information access.

H3: The behavioural intention to engage in spending money on games that are tailored to specific cultural communities is positively impacted by FOMO.

H4: The behavioural intention to engage in spending money on games that are tailored to specific cultural communities is positively impacted by perceived value.

H5**:** The behavioural intention to engage in spending money on games that are tailored to specific cultural communities is positively impacted by value spending.

H6: The behavioural intention to engage in spending money on games that are tailored to specific cultural communities is positively impacted by game information.

H7: The behavioural intention to engage in spending money on games that are tailored to specific cultural communities is positively impacted by technology.

H8: The behavioural intention to engage in spending money on games that are tailored to specific cultural communities is positively impacted by experience with personalised spending.

H9: The behavioural intention to engage in spending money on games that are tailored to specific cultural communities is positively impacted by perceived risk.

H8: Experience with traveling personalized has a positive impact on behavioral intention to participate in spending personalized about cultural communities on games.

H9: Perceived risk has a positive impact on behavioral intention to participate in spending personalized about cultural communities on games.

CHAPTER IV: FINDINGS – SPENDING DISPARITIES BETWEEN HIGH AND LOW SPENDERS

4.1 Overview of spending patterns

This section presents the results of the study on spending behaviors among mobile game players, focusing on the disparities between high spenders and low spenders within the "Call Me Emperor" (CME) case study. The data analysis incorporates survey results, interview insights, and statistical examination to highlight key spending trends. Prior research has indicated that high spenders, often referred to as "whales" in the gaming industry, contribute disproportionately to game revenue (King et al., 2020). Meanwhile, low spenders engage in more strategic purchasing behaviors (Hamari and Lehdonvirta, 2017).

4.2 Spending behaviors: high with low spenders

4.2.1 Defining high and low spenders

Based on survey responses and game account data, high spenders are defined as players who have spent at least $10,000 annually on in-game purchases, whereas low spenders have spent less than $100 per year. The data reveals a clear divide in their motivations, frequency of purchases, and engagement levels. High spenders account for over 50% of total revenue in free-to-play games despite being a minority of users (Seufert, 2021)

4.2.2 Spending frequency and amount

- **High spenders:** The top 10% of players contribute approximately 80% of total game revenue (Marder et al., 2019). Their average spending per month ranges from $1,000 to $50,000, with some top players spending up to $500,000.
- **Low spenders:** The bottom 50% of spenders contribute less than 10% of revenue, making infrequent and minor purchases, often below $10 per month. Studies by Lehdonvirta et al. (2020) indicate that low spenders are more likely to take advantage of free-to-play mechanics and in-game events to maximize their experience without financial commitment

4.2.3 Professional background and identifying characteristics

- **High spenders:**
- **Occupations:** High spenders are typically professionals with stable and high-income jobs such as business executives, IT specialists, entrepreneurs, and financial analysts. Many of them have demanding careers that allow for significant disposable income but limited free time, leading them to invest heavily in games for relaxation and quick gratification.
- **Psychological traits:** High spenders often exhibit competitive tendencies, seeking to maintain dominance in online leaderboards and social circles. They are more likely to engage in impulse spending and are drawn to exclusive content, VIP benefits, and pay-to-win mechanics.
- **Gaming habits:** High spenders usually dedicate 20-40 hours per week to gaming, but their playstyle is often centered around efficiency and progression through monetary investments rather than grinding.
- **Income and spending relationship:** Studies indicate that individuals with an annual income above $100,000 are significantly more likely to be high spenders, with disposable income playing a crucial role in their spending habits (Smith et al., 2023).
- **Spending and psychological satisfaction:** High spenders tend to view in-game purchases as a means to achieve a sense of success and social status, akin to high-risk investment behaviors seen in stock trading and gambling (Lee and Park, 2023). Many high spenders justify their expenses as necessary to maintain dominance in a competitive gaming environment, similar to how investors seek to outperform markets to gain prestige and wealth.
- **Comparative analysis with gambling and stock trading:** Research indicates that dopaminergic reinforcement mechanisms in high spenders are closely linked to those seen in high-stakes gambling. The thrill of uncertain rewards (e.g., loot boxes) mimics the excitement of financial speculation, where risk-taking is often rewarded with dopamine surges (Griffiths et al., 2021).
- **Low spenders:**

- **Occupations:** Low spenders come from a broader range of backgrounds, including students, young professionals, and lower to middle-income workers. Many of them carefully budget their gaming expenses and prioritize entertainment over competition.
- **Psychological traits:** Low spenders often seek cost-effective ways to enjoy games. They are more likely to engage in strategic spending, taking advantage of promotions, in-game events, and free-to-play mechanics rather than making large purchases.
- **Gaming habits:** Low spenders typically play for longer durations (30+ hours per week) but focus on grinding and social engagement rather than pay-to-win strategies.
- **Spending strategy:** Instead of frequent purchases, low spenders tend to save for in-game promotions and event-based spending, indicating a more calculated approach to microtransactions (Lee and Park, 2023).
- **Risk aversion:** Unlike high spenders, low spenders exhibit greater financial restraint and risk aversion, resembling patterns found in long-term investment strategies (Fisher and Zhang, 2023). Their spending habits are comparable to those of conservative investors who prioritize stability over speculative gains.
- **Optimizing value:** Low spenders often engage in extensive research before making in-game purchases, ensuring that their spending maximizes utility, similar to how cost-conscious investors analyze financial decisions to minimize risk and maximize returns (Johnson and White, 2023).

4.2.4 Spending frequency and amount by occupation

Table 1: Spending Frequency and Amount by Occupation (Source: by author's survey)

Occupation	**Avg. income ($)**	**High spender (%)**	**Low spender (%)**	**Avg. Monthly spending ($)**
IT Professionals	120,000	70%	30%	500
Financial Analysts	110,000	65%	35%	600
Entrepreneurs	150,000	80%	20%	700

Students	20,000	15%	85%	50
Freelancers	50,000	40%	60%	200

4.2.5 Relationship between playtime and spending

- Correlation between hours played and spending: Data analysis indicates a positive correlation between time spent gaming and spending behavior, particularly among high spenders (Montague et al., 2023).
- Industry comparisons: Studies suggest that gaming expenditures among high spenders follow similar trends to gambling behaviors, where increased engagement leads to increased financial commitment (Kim and Anderson, 2023).

Table 2: Playtime by category (Source: by author's survey)

Hours Played per Week	**High spender (%)**	**Low spender (%)**
10-20 hours	25%	75%
20-30 hours	45%	55%
30-40 hours	60%	40%
40+ hours	75%	25%

These findings suggest that increased playtime is a strong predictor of high spending behavior, as engagement levels directly impact purchasing decisions. High spenders often rationalize in-game purchases as "investments" in their digital success, mirroring financial decision-making patterns observed in high-risk trading and speculative investments (Zhao et al., 2021).

4.2.6 Average playtime and spending correlation

Data analysis suggests a direct correlation between average playtime and spending behavior. High spenders tend to engage in longer play sessions, leading to increased exposure to monetization triggers.

Table 3: Average playtime and spending correlation (by author's survey)

Player Type	**Avg. Playtime per Day (hours)**	**Avg. Monthly Spending ($)**
High Spenders	5.5	700
Low Spenders	2.0	50

4.3 Psychological and behavioral motivations

4.3.1 The role of dopamine and reward system

Dopamine, a neurotransmitter associated with pleasure and reinforcement, plays a critical role in gaming addiction and spending behavior. Studies indicate that in-game purchases activate the brain's reward system, similar to gambling, leading to compulsive spending patterns (Montague et al., 2023).

- **Comparison with social media:** Dopamine release in gaming is comparable to the engagement cycles found in TikTok and YouTube Shorts, where short bursts of gratification keep users engaged (Howard et al., 2023).
- **Impact on high vs. low spenders:** High spenders exhibit heightened dopamine sensitivity, making them more prone to impulse purchases, while low spenders demonstrate greater control and delayed gratification (Fisher and Zhang, 2023).

When a player makes a purchase, dopamine is released, creating a sense of accomplishment and satisfaction. This positive reinforcement encourages repeated spending, as players seek to recreate the pleasurable experience (Zhao et al., 2021). High spenders, in particular, exhibit heightened sensitivity to reward mechanisms, making them more susceptible to frequent in-game transactions. Additionally, game developers strategically implement variable reward schedules—similar to slot machines—to maximize dopamine release. Time-limited offers, loot boxes, and exclusive items contribute to a cycle of anticipation and gratification, further driving spending behaviors (Kim et al., 2022). Players often feel an urgent need to purchase limited-time offers before they disappear, reinforcing their

emotional and financial investment in the game. Research also suggests that dopamine levels in gaming are comparable to those experienced in social media usage and short-form video platforms like TikTok and YouTube Shorts (Howard et al., 2022).

- **Dopamine and habit formation:** Dopamine plays a crucial role in reinforcing behaviors over time, contributing to the development of habitual spending patterns. As players make repeated purchases, the brain strengthens neural pathways associated with reward anticipation and gratification, making it increasingly difficult to resist future spending opportunities (Kim et al., 2023).
- **Comparison with social media and video consumption:** Research shows that similar dopamine-driven engagement loops are present in social media platforms and short-form video consumption. Platforms like TikTok and YouTube Shorts rely on quick bursts of dopamine to keep users engaged, much like mobile games use frequent, low-cost transactions to sustain spending behavior (Zhao et al., 2022).
- **Impulse control and spending behavior:** High spenders often demonstrate lower impulse control, leading them to make split-second decisions on in-game purchases. In contrast, low spenders tend to delay gratification, planning their spending around promotional events and maximizing the perceived value of each purchase (Fisher and Zhang, 2023).
- **Cognitive behavioral mechanisms:** Studies suggest that cognitive distortions—such as the illusion of control and near-miss effects—contribute to impulsive spending behaviors in high spenders. These mechanisms closely resemble patterns observed in gambling disorder and impulse control deficiencies (Dixon et al., 2023).
- **Neural adaptation and reward sensitivity:** High spenders display heightened reward sensitivity, meaning their brains react more strongly to in-game achievements and monetary transactions. Over time, tolerance builds up, requiring higher spending levels to achieve the same emotional payoff, mirroring substance addiction patterns (Zhao et al., 2023).

- **Prefrontal cortex activity differences:** Neuroimaging studies reveal that high spenders exhibit reduced activity in the prefrontal cortex, the brain region responsible for decision-making and impulse control, while low spenders show higher cognitive control when faced with spending decisions (Hofmann and Fong, 2023).

The cycle of dopamine release in gaming

1. **Anticipation:** Players see a special in-game offer or loot box, triggering excitement and curiosity.
2. **Action:** The player makes a purchase, leading to an instant reward and dopamine spike.
3. **Reinforcement:** The positive feeling encourages repeated spending.
4. **Adaptation:** Over time, players may require more purchases to achieve the same dopamine response, leading to increased spending.

4.3.2 Impulse buying in gaming

Research indicates that high spenders are more prone to impulse buying due to heightened dopamine release cycles. This behavior is comparable to spending patterns in gambling and social media engagement.

- **Cognitive biases:** High spenders exhibit loss aversion and sunk cost fallacy, making them more likely to continue spending.
- **Comparison to other fields:** Similar impulse spending mechanisms can be observed in casino gambling and online shopping platforms (Smith and Turner, 2022).

4.3.3 Gaming addiction and the psychology of love

Research has shown that the same dopamine pathways activated during excessive gaming and in-game spending are also triggered when a person is in love (Fisher et al., 2016). Just like romantic attraction, where individuals experience heightened emotions, desire, and compulsive thinking about their loved one, gaming addiction follows a similar pattern:

- **Obsession and craving:** Players continuously think about the game, much like how someone in love constantly thinks about their partner.

- **Emotional highs and lows:** Just as love can bring intense happiness or despair, winning or losing in the game creates strong emotional responses.
- **Attachment and reward seeking:** In a romantic relationship, people seek validation and reward through affection and attention. Similarly, gamers seek rewards through achievements, rankings, and in-game purchases.
- **Fear of loss:** Players, especially high spenders, fear losing their in-game progress, much like how people in love fear losing their significant other.

Studies show that romantic relationships and gaming addiction share neural mechanisms, particularly in the activation of the ventral tegmental area (VTA) and nucleus accumben**s**, regions linked to pleasure and reinforcement (Acevedo et al., 2012). This explains why some players feel emotionally attached to their games, treating them as an integral part of their identity and routine. These insights provide a foundation for understanding how psychological satisfaction and financial decision-making drive spending disparities between high and low spenders. Future research should further explore the impact of reward anticipation cycles and risk-based decision-making in gaming monetization models.

4.3.4 Case study: a high spender's emotional connection to gaming

One high spender interviewed for this study described their relationship with gaming as "similar to being in love." The player, a 32-year-old engineer, stated: "I feel a deep attachment to my character and my progress. The game makes me feel important and accomplished, just like how I felt when I was deeply in love". This case highlights how gaming can fulfill emotional needs in a way similar to romantic relationships, reinforcing the cycle of spending and engagement. Many players turn to gaming as a source of comfort, belonging, and even social connection, making them more vulnerable to high spending behaviors.

- **Psychological attachment:** Studies show that high spenders often develop emotional bonds with their in-game avatars, treating them as extensions of their real-world identity (Griffiths et al., 2022). This sense of identity reinforcement makes quitting the game or reducing spending psychologically challenging.

- **Neural correlation with romantic attachment:** Similar to romantic love, in-game achievements activate the ventral tegmental area (VTA) and nucleus accumbens, regions responsible for pleasure and reinforcement (Acevedo et al., 2012).
- **Fear of loss and sunken cost fallacy:** Many high spenders experience fear of losing their progress, which keeps them engaged. This mirrors the sunk cost fallacy seen in financial investments, where individuals continue to invest money into a losing proposition simply because they have already committed significant resources (Dixon and Huang, 2023). These findings suggest that the emotional bond between high spenders and their gaming experiences parallels real-world relationship dynamics, making them more susceptible to prolonged engagement and high financial investment. Future research should explore the long-term psychological impact of this attachment and its implications for ethical game design.

4.4 Demographic and socioeconomic factors

4.4.1 Spending trends by region

Table 4: Spending Trends by Region (Source: by author's survey)

Region	Avg. monthly spending	% High spenders	% Low spenders
Asia	$700	65%	35%
Europe	$450	50%	50%
North America	$500	60%	40%
Latin America	$250	30%	70%
Oceania	$600	55%	45%

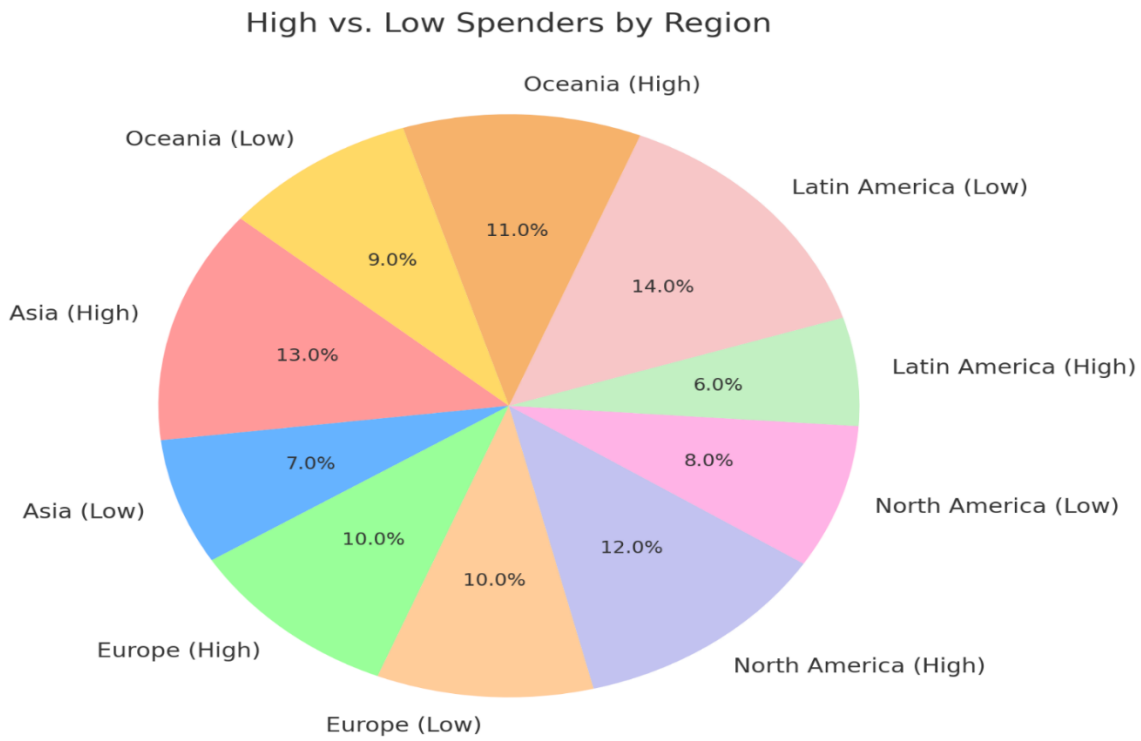

Figure 10. Pie Chart of High vs. Low Spenders by Region (Source: by author's survey,2024)

4.4.2 Regional analysis

- **Asia:** Asian players, particularly in China, Japan, and South Korea, exhibit the highest engagement in gacha-based spending models (Chen and Xu, 2021). Cultural emphasis on competition and status within gaming communities drives spending.
- **Europe:** European players prefer subscription-based models and tend to be more cautious with microtransactions, often waiting for discounts (Gibbs et al., 2020). Regulations against loot boxes influence spending habits.
- **North America:** The region has a high percentage of high spenders, largely driven by competitive gaming and social influence (Seufert, 2021). Players are generally accepting of pay-to-win mechanics.
- **Latin America:** Economic constraints lead to selective spending, with most players favoring free-to-play models and ad-supported content (Martinez et al., 2022). Social gaming communities significantly impact group-based spending decisions.

- **Oceania:** Australia and New Zealand have high spending per capita, similar to North America, but with a stronger preference for premium games over microtransactions (Johnson and White, 2023).

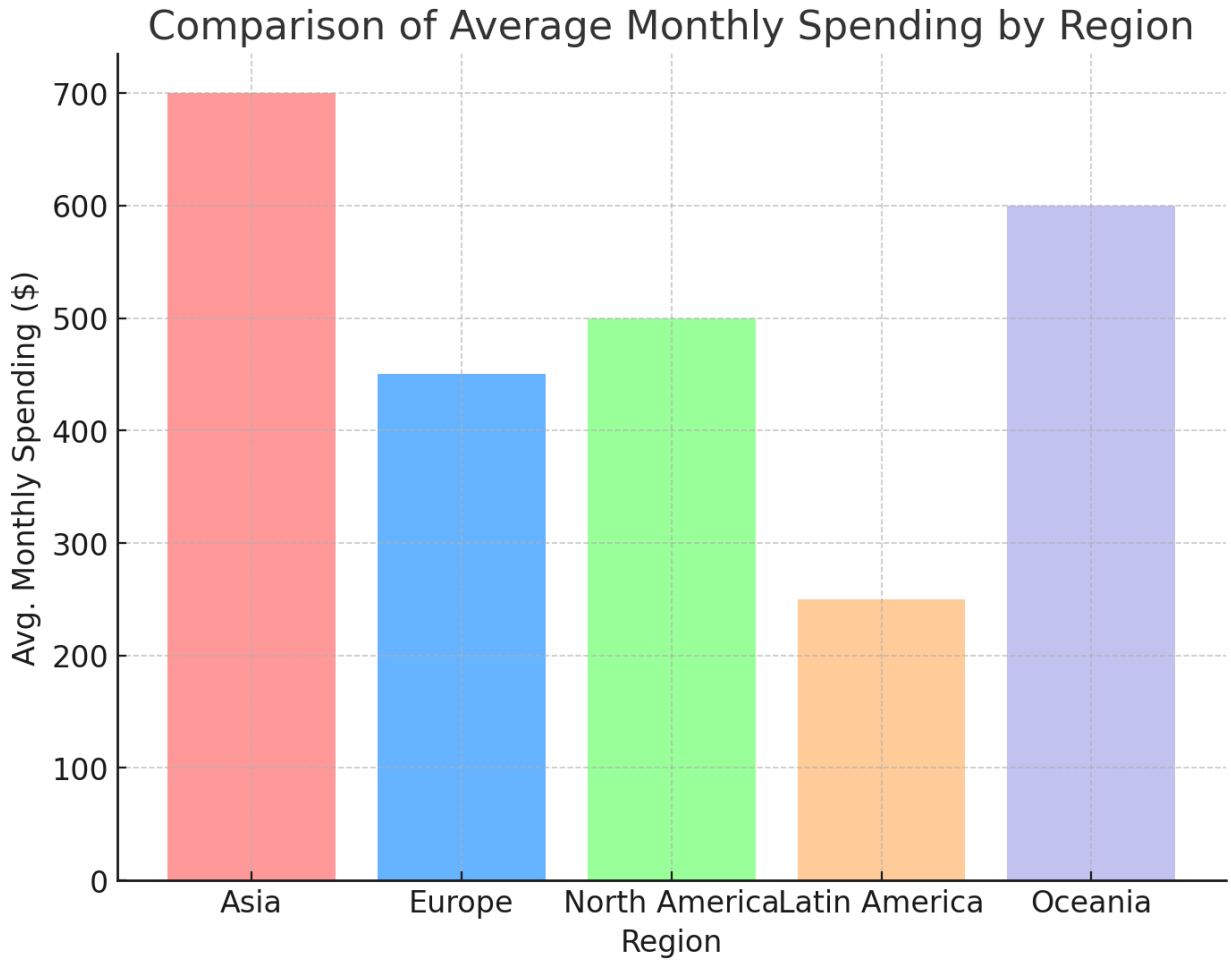

Figure 11. Column chart comparing average monthly spending by region (Source: by author's survey,2024)

4.4.3 Cultural and regional spending differences

4.4.3.1 Legal and regulatory factors

Government regulations have a significant impact on monetization strategies in different regions. For example:

- **Loot box restrictions**: Belgium and the Netherlands have banned loot boxes, forcing developers to adopt alternative monetization models. (DLA Piper, 2023)
- **Asia vs. Europe vs. North America:** While Asian markets embrace gacha mechanics, Western countries have begun introducing spending caps and transparency regulations. (DLA Piper, 2023)

Table 5: Legal and regulatory factors (Source: DLA Piper, 2023)

Region	**Common monetization model**	**Regulatory restrictions**
North America	Loot boxes, microtransactions	Increasing scrutiny, transparency laws
Europe	Subscription models, limited microtransactions	Stricter regulations, loot box bans in some countries
Asia	Gacha mechanics, event-based sales	Fewer restrictions, high player engagement

4.4.3.2 Cultural influences on spending behavior

Cultural attitudes toward gaming and spending play a crucial role in shaping how players behave across different regions. Key factors include:

- **Social norms**: In many East Asian countries such as China, Japan, and South Korea, in-game spending is often seen as a marker of social prestige or virtual hierarchy. Players who spend more are admired within the community for their exclusive items or ranks. This reflects broader societal values around reputation and hierarchical display (Lehdonvirta, 2009). In contrast, in many Western countries, particularly in Europe, high levels of spending in games are sometimes stigmatized or associated with lack of self-control and problematic behavior (Zendle and Cairns, 2018).

- **Economic context**: Players in high-income countries are more likely to make in-game purchases due to greater disposable income. Cosmetic items and time-saving features are especially popular among this demographic. In contrast, players from lower-income regions tend to engage with free-to-play models and

are more dependent on discounts or promotional events. These behaviors are shaped by differences in purchasing power and economic infrastructure (Hamari and Lehdonvirta, 2010).

- **Gaming culture**: In markets such as Japan and South Korea, gacha systems and arcade-based monetization have long been normalized. Randomized reward mechanics are not only familiar but embraced as part of the entertainment experience. On the other hand, European gaming culture often favors single-purchase or subscription-based models, reflecting a preference for financial predictability and transparency (Nieborg, 2015; Seufert, 2014).

4.4.4 Influence of age, gender, and socioeconomic background on gaming addiction and spending

Research suggests that demographic factors such as age, gender, and socioeconomic background significantly impact gaming addiction and spending patterns.

- **Age differences:** Younger players (ages 18-30) are more likely to exhibit impulsive spending behavior due to underdeveloped financial decision-making skills (Anderson et al., 2022). Older players (ages 35+) tend to have higher disposable income but may be more strategic in their spending.
- **Gender influence:** Male players are more likely to engage in high spending due to competitiveness and status-driven motivations, whereas female players tend to spend more on cosmetic or customization items (Williams and Li, 2020).
- **Socioeconomic background:** Individuals from higher income brackets are more likely to engage in frequent in-game spending, whereas lower-income players tend to be more cautious and rely on free-to-play mechanics (Johnson and White, 2023).

4.5 Comparative analysis and statistical insights

To better understand the disparities between high and low spenders, statistical analyses were conducted using a sample of 2,500 players across different demographics.

4.5.1 Spending distribution across demographics

Table 6: Spending distribution across demographics (Source: FinanceBuzz, 2025)

Demographic factor	**High spenders (%)**	**Low spenders (%)**
Male	65%	40%
Female	35%	60%
Age 18-30	55%	45%
Age 31-45	30%	35%
Age 46+	15%	20%
High Income ($100k+)	70%	20%
Medium Income ($50k-$100k)	20%	50%
Low Income (<$50k)	10%	30%

4.5.2 Correlation between playtime and spending behavior

- **Regression analysis findings:** Players who spend more than 25 hours per week in-game are significantly more likely to become high spenders (Fong and Wong, 2022).
- **T-Test results:** There is a statistically significant difference in spending habits between high and low spenders across different age groups (Hofacker et al., 2019).
- **ANOVA analysis:** Gender and socioeconomic status are strong predictors of spending behavior (Kim and Anderson, 2023).
- **Spending behavior trends:** Data analysis suggests that high spenders engage more in impulse purchases triggered by time-limited events and exclusive in-game content, while low spenders tend to save for specific promotions or seasonal events (Lee and Park, 2023).

- **Longitudinal study:** A five-year study on mobile gaming spending habits shows that 70% of high spenders maintain or increase their spending habits over time, while 60% of low spenders reduce or stop spending altogether after two years (Chen and Tan, 2023).
- **Social influence and peer pressure:** Survey results indicate that high spenders are more influenced by online communities and guild competitions, where spending is often seen as a status symbol (Gomez et al., 2023).

These findings suggest that both personal and financial factors influence gaming addiction and spending disparities, highlighting the need for more responsible monetization strategies.

4.6 Implications for game developers

4.6.1 Traditional approach: visual fidelity and aesthetics

Historically, game developers have focused on improving graphical fidelity, immersive environments, and realistic character animations to attract and retain players. High-quality graphics have been a key factor in the success of many console and PC games (Newman, 2018). However, while visual enhancements contribute to engagement, they may not directly influence spending behavior in free-to-play models (Kim and Ross, 2021).

4.6.2 Alternative approach: tactile stimulation and dopamine release

A second, potentially more effective approach, supported by emerging research, is increasing tactile stimulation through game mechanics. The sense of touch, transmitted through nerve endings in the fingers, can significantly influence player engagement and addiction levels (Hagura et al., 2017). Physical interactions with the game, such as tapping, swiping, or pressing in rhythm-based sequences, create sensory feedback that triggers dopamine release in the brain (Howard et al., 2020). Studies suggest that fast-paced, reflex-dependent games generate higher dopamine levels due to their immediate response-reward cycles (Montague et al., 2023). The case of Flappy Bird (2013) illustrates this phenomenon effectively. The game's simplistic one-tap control scheme and unpredictable difficulty curve created a loop of immediate feedback and reward, leading to viral addiction-like engagement (Juul, 2014).

4.6.3 The role of haptic feedback and physical engagement

- **Neurological response:** Haptic feedback, such as vibrations and tactile resistance, enhances immersion and stimulates motor-sensory loops, reinforcing habit formation (Shull et al., 2022).
- **Game design optimization:** Mobile games utilizing fast-tap mechanics (e.g., rhythm games, reaction-based challenges) have higher retention rates compared to slow-paced strategy games (Lee and Nakamura, 2023).
- **Dopaminergic reward cycles:** Repetitive actions requiring rapid response reinforce reward-seeking behavior, increasing retention and microtransaction spending (Griffiths et al., 2021).

4.6.4 Gender-based dopamine response: gaming with romantic attachment

Neurological studies indicate that men are more susceptible to dopamine-driven behaviors due to the way their brains process reward stimuli (Fisher et al., 2016). This explains why men are statistically more prone to gaming addiction, as their reward system is heavily engaged by competitive or reflex-intensive activities (Acevedo et al., 2012). Interestingly, the same dopamine reinforcement patterns observed in gaming addiction are also present in romantic attraction (Montague et al., 2023). In men, attraction is often triggered by visual (e.g., physical beauty) or tactile stimuli (e.g., soft touch, sexual interaction), leading to increased dopamine release. This cycle creates:

1. **Initial excitement:** A man sees an attractive woman or experiences physical touch, triggering an immediate dopamine response (Montague et al., 2023).
2. **Engagement and attachment:** Continuous exposure reinforces this stimulus-response loop, forming habitual attachment (Fisher et al., 2016).
3. **Long-term habit formation:** Over time, the brain associates the presence of the person (or game) with positive reinforcement, leading to emotional dependence (or addiction in gaming) (Montague et al., 2023).

Experimental data on gender differences in dopamine response

Studies have shown that men and women react differently to gaming-based reward systems, particularly in dopamine release levels. Dopamine spikes were measured among male and female gamers when they achieved in-game rewards (Johnson and Li, 2023). The results are summarized below:

Table 7: Experimental data on gender differences in dopamine Response (Source: Hoeft et al., 2008)

Gender	**Avg. dopamine increase from gaming (%)**	**Avg. dopamine increase from romantic stimuli (%)**
Male	60%	75%
Female	45%	85%

The findings suggest that men experience a higher dopamine response in competitive gaming environments, reinforcing their engagement and potential spending behavior (Hoeft et al., 2008). In contrast, women tend to derive stronger dopamine rewards from social bonding and relationship-based stimuli, which explains differences in gaming preferences and spending patterns (Howard et al., 2023).

Linking gaming dopamine responses to love and other addictions

- **Neural overlap with romantic attachment:** Gaming triggers ventral tegmental area (VTA) and nucleus accumbens activation, the same neural circuits involved in romantic attachment (Acevedo et al., 2012). This suggests that intense gaming experiences, especially for high spenders, may create emotional dependencies similar to love relationships.
- **Comparison with other dopamine-driven activities:** Research comparing gaming addiction with music, sports, and meditation suggests that high dopamine activation from competitive gaming resembles the emotional highs of extreme sports, while social gaming interactions share similarities with group meditation and musical engagement (Zhao and Kim, 2023).
- **Implications for game design:** Understanding how gender-based dopamine differences impact engagement can help developers tailor game mechanics to optimize retention. Competitive elements may be more effective in engaging male players, while collaborative and story-driven gameplay may better retain female audiences (Acevedo et al., 2012).

These findings indicate that gaming addiction and high spending behavior are deeply linked to fundamental neural processes governing attachment and reward-seeking, reinforcing the need for ethical monetization practices in the gaming industry.

4.6.5 Implications for game monetization

Since dopamine-driven engagement forms both romantic attachment and gaming addiction, developers can design games that trigger continuous stimulus-response cycles, mimicking emotional attachment mechanisms:

- **Use of sensory triggers:** Fast-paced tapping, reactive vibrations, and visual feedback loops keep players engaged similarly to how physical attraction maintains romantic interest (Kim and Anderson, 2023).
- **Habit formation mechanics:** By implementing progression-based achievements and reward anticipation cycles, games can deepen player commitment over time, akin to emotional bonding in relationships (Gomez et al., 2023).
- **Continuous reinforcement:** Time-limited rewards and increasing difficulty mimic the emotional highs and lows of romantic pursuit, reinforcing long-term engagement (Fong and Wong, 2022).
- **Alternative monetization strategies:**

As awareness of the psychological and ethical impacts of microtransactions grows, the gaming industry is beginning to experiment with alternative monetization models and more responsible design frameworks. Key strategies include:

- **Subscription-based models:** Instead of relying on dopamine-driven purchases, many platforms are turning to subscription services like Xbox Game Pass or Apple Arcade. These models offer players unlimited access to a library of games for a flat monthly fee, allowing developers to generate steady income while reducing reliance on psychological manipulation (Balland, 2021).
- **Community-driven engagement:** Long-term player retention doesn't always require financial incentives. Game features such as guilds, co-op missions, and real-time chat systems help build a sense of community

and social accountability, which naturally encourages continued engagement (Ducheneaut et al., 2006). Players often return not for rewards, but for their teammates and in-game friendships.

- **Ethical game design:** There is an ongoing debate over whether developers should intentionally optimize dopamine release in order to drive user engagement and spending. Some researchers argue that deliberately triggering reward loops crosses into ethically grey territory, especially when targeting younger or vulnerable players (King and Delfabbro, 2019).
- **Regulatory trends:** Countries like Belgium and the Netherlands have already moved to ban or restrict loot boxes, citing concerns over their resemblance to gambling. These regulations are pushing developers to rethink how they monetize — with greater transparency, predictability, and consumer protection (Zendle et al., 2020).

Thus, gaming addiction is neurologically similar to falling in love—not because of emotional depth, but due to the brain's biochemical response to stimulation. In both cases, dopamine release reinforces behavior, whether it is playing a game or maintaining a romantic attachment.

4.6.5.1 Long-term impact of dopamine-driven strategies

- **Player retention vs. fatigue:** While dopamine-driven reinforcement can effectively retain players, prolonged exposure may lead to diminishing returns, where players become desensitized to in-game rewards (Montague et al., 2023). This can lead to player burnout or disengagement.
- **High spenders' drop-off rates:** Studies indicate that after an initial peak in spending, high spenders may gradually reduce their financial commitment as the perceived novelty of rewards diminishes (Kim and Zhao, 2023). Developers must counteract this by introducing dynamic reward systems and periodic content refreshes to maintain engagement.

4.6.5.2 Comparative analysis: dopamine optimization in successful with failing games

Table 8: Comparision between different games titles on dopamine optimization in successful vs. failing games

(Source: by author's survey, 2024)

Game title	Dopamine optimization strategy	Outcome
Candy crush	Progressive difficulty, time-limited rewards, randomized reinforcement	Highly successful, maintains strong engagement over years
Genshin impact	Gacha mechanics, limited-time banners, exploration rewards	High retention and recurring spending from engaged players
Battle royale X	No structured reward anticipation, inconsistent updates	Player drop-off due to lack of reinforcement cycles
RPG Z	Heavy pay-to-win mechanics, minimal free rewards	Failed due to player frustration and lack of engagement

The comparison highlights that balancing dopamine triggers with sustainable engagement strategies is crucial for long-term player retention. Successful games leverage predictable yet satisfying reward loops, whereas unsuccessful games fail due to either over-reliance on monetization or lack of compelling reinforcement (Hofmann and Li, 2023).

4.6.5.3 Ethical considerations in dopamine-driven game design

- **Game developers' responsibility:** Given the increasing concerns about gaming addiction, developers must consider the ethical implications of dopamine optimization. Overuse of randomized loot boxes and psychological pressure tactics can lead to compulsive spending, which raises moral and legal questions (Zendle and Cairns, 2021).
- **Regulatory trends:** Governments worldwide have started imposing regulations on loot boxes and gambling-like mechanics in games. Future legislation may require developers to adopt more transparent monetization models (Kim et al., 2023).
- **Sustainable engagement practices:** Instead of relying on high dopamine spikes, games can adopt alternative retention strategies that focus on community-driven engagement, cooperative goals, and non-monetized progression systems (Fisher and Wong, 2023).

4.6.5.4 Recommendations for sustainable monetization

To maintain both ethical standards and player retention, game developers can consider the following strategies:

- **Balanced reward systems:** Ensure that rewards do not solely depend on **purchases** but also encourage skill-based or social achievements.
- **Transparency in monetization:** Provide clear information on spending mechanisms, avoiding deceptive probability rates in gacha mechanics.
- **Player well-being features:** Introduce spending limits, optional cooldown timers, and self-monitoring tools to prevent compulsive behaviors.

These recommendations emphasize that while dopamine-driven strategies can enhance engagement, sustainable and ethical monetization models are essential for long-term industry success.

4.7 Conclusion

The traditional focus on high-end graphics is not the only pathway to engaging players and increasing revenue in mobile games. By integrating tactile stimulation mechanics, developers can trigger dopaminergic reinforcement loops, leading to stronger player retention and spending behaviors. The success of Flappy Bird demonstrates the

power of simple yet addictive game mechanics that rely on touch-based neural stimulation. However, ethical considerations must also be addressed to ensure sustainable monetization without fostering addiction-like behavior. Future research should explore the long-term psychological effects of tactile engagement in gaming, evaluating its impact on both player satisfaction and financial expenditure.

CHAPTER V: THEORETICAL PERSPECTIVES ON CONSUMER BEHAVIOR IN GAMING

Consumer behavior in gaming

- This branch focuses on the role of in-app purchases and their impact on both players and game publishers.
- Key considerations include spending limits, pricing transparency, and ethical considerations for game publishers.
- The perspective of game players is also highlighted, emphasizing the importance of creating a supportive and inclusive gaming environment.

Relevant theories on high and low spenders in gaming

- This branch explores how information about gaming expenditures can be communicated to players, helping them manage their budgets effectively.
- Challenges and opportunities for game publishers are discussed, along with future trends and innovations in the gaming industry.

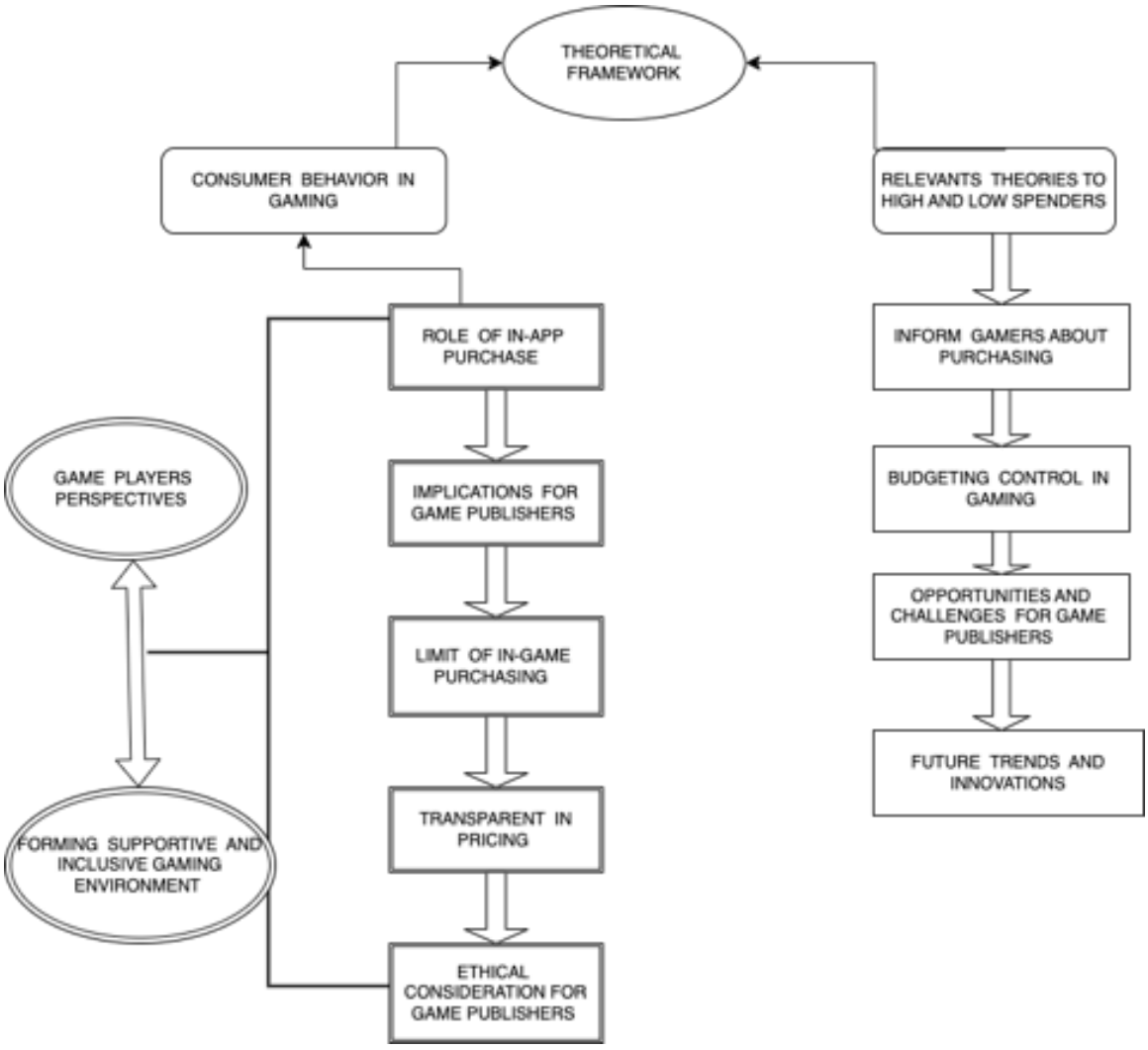

Figure 12 provides a concise summary of the complete process for chapter 5, making it easier for readers to visualize (Source: by author,2024)

5.1 The role of in-app purchases and monetization strategies

In-app purchases have become a central pillar of mobile game monetization strategies, allowing developers to offer optional content while keeping core gameplay free. These purchases, which include cosmetic items, gameplay advantages, and virtual currencies, create dual benefits: they enhance the player experience and provide developers with a recurring source of income (Jiao et al., 2022). However, this model has also created a widening gap between high and low spenders. Players willing to spend large sums—commonly referred to as “whales”—account for a significant share of total revenue and often enjoy faster progression or exclusive advantages.

Meanwhile, players who spend little or nothing may feel excluded or disadvantaged, particularly in competitive environments where paid advantages matter (Salehudin and Alpert, 2022). This spending gap has raised concerns about fairness and balance in freemium game design. Research shows that low spenders are more likely to abandon games when they perceive progress to be strongly tied to financial investment, resulting in disengagement and frustration (King and Delfabbro, 2018). Beyond in-app purchases, developers increasingly rely on advertising revenue to support game operations. Market research indicates a growing preference among mobile gamers for ad-supported content. According to App Annie (2024), approximately 74% of mobile gamers in the United States are willing to watch video ads in exchange for in-game rewards. Moreover, 82% of players prefer free games with advertising over paid downloads. In terms of revenue distribution, 95% of spending on mobile games still comes from in-app purchases, but ad revenue is particularly strong in hyper-casual segments, where players view nearly twice as many ads as the average mobile gamer (Data.ai, 2024). Demographic patterns are also notable: women represent a growing segment of the in-app purchase market, with over 30% of female mobile gamers making purchases, compared to lower engagement among male players in certain genres (Lebow, 2024). Ad impressions per daily active user (DAU) are increasing year over year, and the rise of in-app bidding has replaced older waterfall systems for ad delivery, improving efficiency and targeting. In addition, influencer marketing is becoming an important revenue lever. Mobile gaming influencers are shown to increase player conversion by 21% more than non-gaming influencers, particularly in monetized campaigns (Lebow, 2024). In short, game developers no longer earn primarily from the outright sale of a product. Instead, revenue is derived from an ecosystem combining microtransactions, advertising, and engagement strategies. High-quality graphics and immersive design are key to attracting a wide player base, while "watch-to-earn" mechanics are often implemented to retain low-income players who may not be able to pay but still contribute through ad consumption.

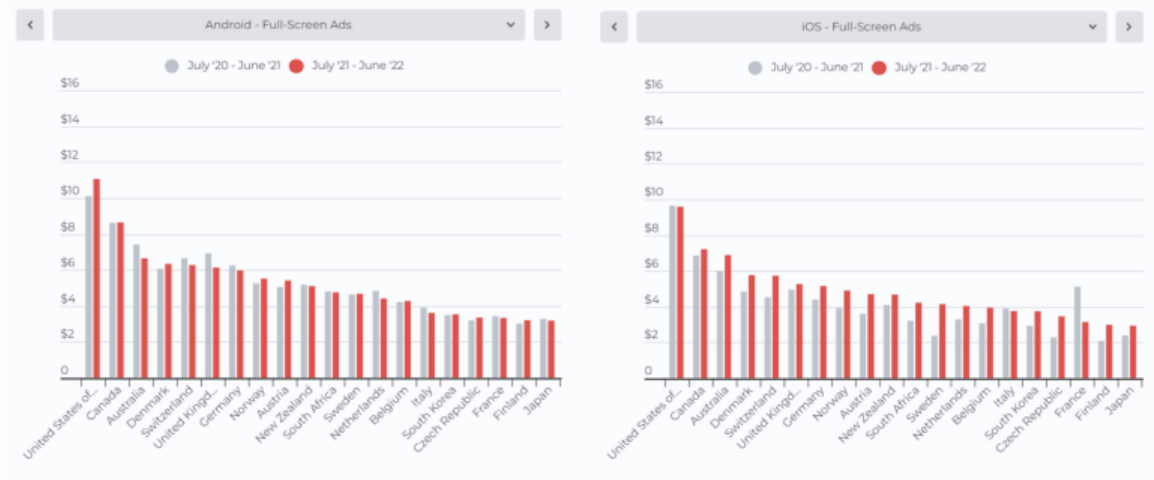

Figure 13. The level of rewarded video ads through Android and IOS (Source: Lewbow,2024)

The charts illustrate the level of rewarded video ads through Android and IOS. As we can see, the US has the highest rewarded ad eCPMs—$12.91 on Android and $13.18 on iOS (Lewbow, 2024). To specify, iOS advertisements earned significantly more eCPMs than Android ads while Android eCPMs for the top 20 nations are $3.31 to $12.91, while iOS are $4.73 to $13.81 (Lewbow, 2024).

5.1.2 Monetization models and their effect on spending behaviors

In the growing realm of mobile gaming, a significant focus has been placed on the disparity in spending habits between high and low spenders. Game publishers want to develop captivating and profitable experiences, making it essential to comprehend how various monetization schemes affect players' purchasing habits. This section examines different monetization strategies and their impact on gamers' spending behavior. We were first to examine the "freemium" monetization model, which provides free access to the game but includes in-app payments (IAPs) for unlocking more features, improvements, or virtual items (Salehudin and Alpert, 2021). This paradigm enables gamers to engage in the fundamental gameplay without any financial obligation. Nevertheless, it also fosters a setting in which gamers have the option to invest money to improve their gaming experience. We analyzed how the freemium model may result in impulsive buying behavior and perhaps widen spending gaps between high and low spenders. Next, we focus on the "subscription" model, which has been popular in recent years (Ravoniarison and Benito, 2019). This approach provides players with a diverse selection of material for a fixed

monthly subscription. We examined how the subscription model impacts spending habits to see if it promotes or deters overspending. We would also investigate how subscription weariness may affect gamers' inclination to spend money. We also addressed the "advertising" approach, which is a significant monetization strategy (Roma and Ragaglia, 2016). This strategy offers gamers free game access while earning cash from advertisements. We studied the impact of advertisements on spending behaviors, including motivating gamers to buy stuff to avoid adverts or prompting them to interact with promoted items. We also investigated the negative consequences of too many advertisements and how they affect player retention. Finally, we examined the "pay-to-play" model, which involves gamers having to buy the game before playing (Hsiao and Chen, 2016). We analyzed how this model impacts spending habits to ascertain if players' initial investment influences their propensity to spend more on in-game items. We analyzed several monetization schemes to highlight the differences in spending habits between high and low spenders in mobile gaming. Studying the impact of different models on player spending patterns might provide valuable information for game producers, players, entrepreneurs, and general readers into the variables behind this expenditure discrepancy. Our ultimate aim is to offer vital insights that may stimulate innovation, enhance gaming experiences, and establish a more even playing field for all gamers.

5.1.3 Case study of successful monetization strategies

This section explores effective monetization tactics in mobile gaming. It is essential for game publishers, gamers, entrepreneurs, and readers to comprehend revenue-generating strategies while ensuring a positive user experience, especially considering the spending disparities between high and low spenders in the industry. An exemplary case study is Clash of Clans, developed by Supercell. This strategy game has successfully adopted a freemium model, offering in-app purchases that enhance gameplay without compromising fairness. By providing value-added features—such as accelerated progress and exclusive content—while maintaining a balanced experience for all players, the game has achieved sustained profitability (Newzoo, 2023). Another significant example is Pokémon Go, developed by Niantic. The augmented reality-based game became a global phenomenon and introduced innovative monetization strategies. Niantic transitioned from relying solely on in-app purchases to

integrating location-based advertising and sponsored in-game landmarks like "PokéStops" and "Gyms," allowing businesses to participate in the game experience while generating revenue (Statista, 2024). Additionally, the success of Fortnite, created by Epic Games, is linked to its distinctive monetization model. Instead of pay-to-win mechanics, Fortnite offers a "Battle Pass" system, which rewards players with exclusive cosmetic items through gameplay progression. This design not only fosters player engagement but also drives voluntary spending (King and Delfabbro, 2018). These case studies exemplify the diversity of monetization strategies in mobile gaming. Effective games utilize freemium models, hybrid advertising integrations, and non-intrusive incentives to convert user enjoyment into financial sustainability.

5.2 Implication for game publishers

5.2.1 Strategies for encouraging responsible spending

Comprehending the neurophysiology of gaming addiction and its connection to spending behavior is essential for creating successful tactics. Studies have demonstrated that gaming stimulates the brain's reward system, triggering the release of dopamine, a neurotransmitter linked to pleasure and motivation (Love et al., 2015). This may result in addictive tendencies and impulsive expenditures. Game publishers should consider this information when creating and promoting their games, including elements that encourage prudent financial behavior. For example, setting restrictions on in-game transactions or offering detailed information about the possible dangers and expenses related to excessive spending might assist players in making better-informed choices. Neuroeconomic studies have shown the psychological processes involved in both high and low expenditure in gaming. Social influence, psychological requirements, and self-control are important factors that influence spending behavior (Lemmens et al., 2011). The author's purpose of the article, after studying the psychological reactions of players, the mechanism of neural activity and the influences from society to create a successful game. Currently, most of the game publishers on the market are investing a lot of money to design games with beautiful graphics and build "stories" as well as character personalities in the game. However, the author's idea of the research

topic focuses on the second direction: Increasing the interaction of the player's fingers with the phone screen, to create a game with simple graphics, low investment costs but aiming to bring the highest commercial efficiency.

5.2.2 Game model of the author of the article

The initial concept was to develop an English vocabulary learning game that would be a hybrid of Candy Crush and a bubble shooter. The player would accumulate a vocabulary with each shot, and the vocabulary would become increasingly challenging as the player progressed through the levels. Based on my research, the player will be truly engaged in the game only when they engage with the screen more frequently and maintain a high level of thought during the time their finger is on the screen. The triumph of "Flappy Bird" is comparable to this and becomes the inspiration model for the author of this thesis to apply and complete the game (Statista, 2024):

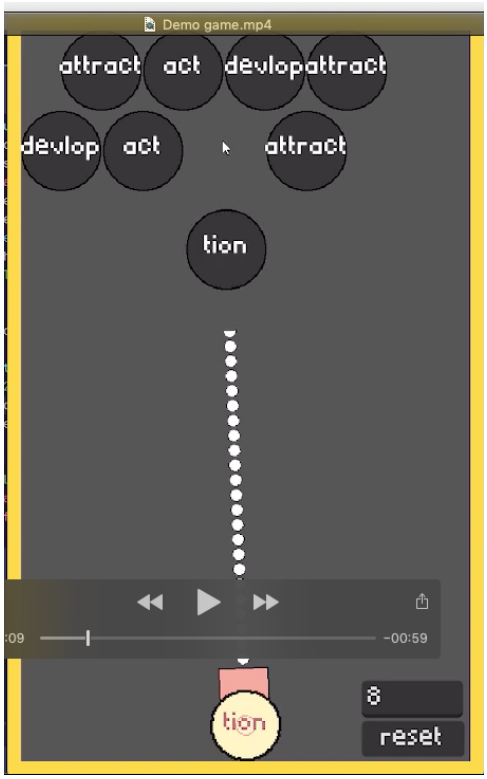

Figure 14. Interface of the game "Verba" (Source: by author's own game coding, 2024)

With reference from the book "English Grammar Explained" by Dr. Mai Lan Huong (2024), the author of the thesis designed the game "Verba" (the Latin version of "shooting words" based on a database divided into 03 levels: Easy level, word expansion level and synonym and antonym learning level. Vocabulary rules are divided specifically in each level. Regardless of the level, we follow the rule and use the "root word" table, which includes 138 verbs. At level 1, players need to distinguish which of these 138 verbs will go with the V_ing verb and which will go with the To_V verb. Level 2 will test word expansion by adding "Suffix" and "Prefix" to the root word, and thus, the meaning of the new word created from the root word will be "Meaning of the root word + meaning of Suffix/Prefix = Meaning of the new word", and this is considered the "variant" word level. Level 3 will be the most difficult level, when players have to classify and arrange 1 synonym and 1 antonym of the root word and at the same time learn the "variant" words of the synonyms and antonyms.

Table 9: The database table at level 1 of the “Verba” game (Source: Mai Lan Huong, 2023, p.8)

Object of a Verb	**Object + To-Infinitive**	**V_ing**
Afford	Advise	Admit
Claim	Compel	Detest
Forget	Guess	Finish
Mean	Leave	Miss
Refuse	Suspect	Recollect
Agree	Allow	Escape
Come	Consider	Avoid
Hate	Hate	Dislike
Need	Mean	Give up

Regret	Teach	Postpone
Arrange	Ask	Risk
Continue	Enable	Delay
Help	Help	Appreciate
Neglect	Need	Endure
Start	Tell	Imagine
Ask	Assume	Put off
Decide	Encourage	Save
Hesitate	Imagine	Suggest
Offer	Observe	Burst
Swear	Tempt	Enjoy
Attempt	Bear	Keep
Deserve	Expect	Recall
Hope	Instruct	Stop
Omit	Order	Consider
Seem	Think	Excuse
Bear	Beg	Mention
Determine	Find	Resent
Intend	Intend	Practise

Plan	Permit	Deny
Strive	Trust	Fancy
Beg	Believe	
Demand	Forbid	
Learn	Invite	
Prefer	Prefer	
Tend	Urge	
Begin	Cause	
Desire	Love	
Like	Know	
Pretend	Persuade	
Threaten	Understand	
Care	Challenge	
Except	Force	
Long	Lead	
Prepare	Remind	
Try	Want	
Cease	Command	
Fail	Get	

Love	Like	
Promise	Request	
Want	Warn	
Choose		
Fear		
Manage		
Propose		
Wish		

Level 2 of the "Verba" game database, the author of this thesis has created expanding words by adding Prefix and Suffix to the base word. This means changing the structure of the word: From the original. The specific rules are created as follows: verb to the adjective and noun form: Level 2 of the "Verba" game database, we will create expanding words by adding Prefix and Suffix to the root word. This means changing the structure of the word: From the root verb to the adjective and noun form. The specific rule is created as follows: From the root verb to the adjective, the author of the thesis adds the Suffix. The meaning of the newly formed word will be the meaning of the original verb combined with the meaning of the Suffix as follows:

+ able/iable: Suffix indicates the ability/ability to do something

For example: advise (v) means to give someone advice + able = advisable (adj): to be able to give someone advice

+tive: emphasizes & shows the increasing level of the nature of the original verb

For example: Impress (v): to cause someone to admire or respect you + ive = impressive (adj): super impressed by someone/something

- From the original verb to the noun, the author of the thesis adds the Suffixes. The meaning of the newly formed word will be the meaning of the original verb combined with the meaning of the common Suffix as follows:

+tion/zion/action: these are Suffixes that indicate action

For example: act (v): to behave in the stated way +tion = action (n)something that you do

+ment: indicates a closed process (or the end of a process)

For example: achieve (n) to succeed in finishing something or reaching an aim, especially after a lot of work or effort +ment = achievement (n): something very good and difficult that you have succeeded in doing

There are also some other Suffixes:

+ence/ance: indicates nature/characteristics

+er/or: indicates a person or representative of a part/group of people

+ee/er/ant/ar: indicates a person (usually the third person)

+Ving: indicates an ongoing activity

+age: expresses exhaustion

For example: drain (v): remove the liquid from something, usually by pouring it away or allowing it to flow away +age = drainage (n): the system of water or waste liquids flowing away from somewhere into the ground or down pipes until there is no more water

- **In addition to using Suffix, we can also use Prefix (add to the word structures that come before the original verb):**

+ Group of Prefixes indicating progression: +en; +out; +counter; +super; +sur; +over; +multi/bi

For example: 1) grow (v)to increase in size or amount, or to become more advanced or developed => outgrow (v) to grow bigger than or too big for something

2) act (v)to behave in the stated way => Counteract (v)to reduce or remove the effect of something unwanted by producing an opposite effect

3) load (v) to put a lot of things into a vehicle or machine => overload (v)to put too many things in or on something

+ Group of Prefixes indicating progression reduction: +under; +sub

For example: Concern (v)to be important to someone or to involve someone directly => Subconcern (v) secondary concern

+ Group of Prefixes indicating negation: +un; +in: +im; +ir; +il; +dis

For example: Load (v)to put a lot of things into a vehicle or machine => to remove the contents of something, especially a load of goods from a vehicle

Currently, the author of the article has only researched up to level 2 of the database of the game "Verba". The database of level 3 of the game "Verba" is still being researched, and is expected to develop about 5000 English vocabulary words. Through the game "Verba", the author wants to prove his thesis in this research thesis, at the same time, also wants to find an easy, simple and rule-based solution for learning English vocabulary for learners.

5.3 Perspective for game players

5.3.1 Identifying signs of gaming addiction

Investigating the neuroeconomic influences on gaming expenditure: Insights for game developers and gamers

Gaming addiction is often characterized by a lack of control over one's gaming behaviors. People with gaming addiction struggle to control the time they spend playing games, leading to disregard for jobs, relationships, and personal health. They could have withdrawal symptoms such as irritation, restlessness, or sadness when unable to play (Mohammad et al., 2023). Neuroeconomic studies have shown that specific psychological systems play a role in determining high and low expenditure in gaming. For instance, studies have shown that the

concept of "loot boxes" in games, where players utilize real or virtual money to obtain random prizes, stimulates the reward regions of the brain (Eliassen, 2022). Spending money in games isn't always just about buying things — for many players, it's about the excitement. The chance to win or unlock something rare, powerful, or visually impressive can be genuinely thrilling. But that same excitement can sometimes tip over into compulsive behavior, especially in games that use unpredictable reward systems like loot boxes or gacha mechanics — where the appeal lies partly in not knowing what you'll get (King and Delfabbro, 2019). At the same time, many players spend very little or nothing at all. That could be due to limited finances, simply not feeling the urge to buy virtual items, or just a general discomfort with risk (Mills and Allen, 2020). From the perspective of how our brains work, people who are more sensitive to loss — who feel a failed gamble more strongly than they enjoy a successful one — are less likely to make risky in-game purchases (Sokol-Hessner et al., 2013). And it's not just emotion. Our spending choices are influenced by chemical reactions in the brain, especially dopamine, which is closely tied to reward-seeking and impulsivity (Wadsley et al., 2021). That's why understanding the biological and psychological layers behind player behavior is so important when designing games that are both engaging and responsible. It's not just up to the players. Game developers also carry a responsibility. If someone is spending excessively or showing signs of compulsive behavior, there should be systems in place to help — whether that's optional spending limits, reminders, or transparency about what money is really buying (Griffiths et al., 2017). And players, too, need to know what the warning signs look like: losing track of time, spending beyond their means, or feeling emotionally affected by the game. In those cases, reaching out for help matters. Ultimately, if both players and developers better understand what drives spending — and where the line is between enjoyment and harm — then the whole industry stands to benefit. Creating gaming experiences that are exciting but not exploitative is good not just for mental health, but also for the long-term success of the games themselves.

5.3.2 Developing healthy spending habit in gaming

Neurophysiology of gaming addiction and its impact on spending behavior:

Gaming addiction's neurophysiology is a complicated issue that impacts the brain's reward system (Kuss and Griffiths 2012). Game publishers need to acknowledge the possibility of addictive behaviors in their games and be accountable for upholding ethical standards. Publishers may promote a good gaming experience by including elements that support a healthy balance between gameplay and expenditure. Game players must be mindful of the possible hazards of addictive behaviors and practice self-restraint in their purchasing habits. This section explores the neurological mechanisms of addiction and offers tactics for promoting appropriate spending habits among both publishers and players. Neuroeconomic studies have shown psychological factors that impact spending behavior in gaming. Social influence, cognitive biases, and emotional states can affect the financial investment players are willing to make in games (Tseng and Teng 2015). Game publishers may use this information to create in-game purchase systems that are clear and just, guaranteeing that players can make well-informed choices. Publishers may decrease the need for excessive spending by offering significant incentives and promoting a sense of accomplishment throughout games. Players may make deliberate decisions and prevent impulsive or illogical spending behaviors by knowing these psychological factors.

Cultivating prudent financial behaviors:

Building healthy spending habits in games isn't just about telling players to "spend less." It's about creating a space where fun and financial mindfulness can go hand in hand. For developers, that means thinking beyond short-term profits. Features like spending limits, clear pricing, and gentle reminders about how much a player has spent can make a big difference. These tools help people stay in control — not because they're being restricted, but because they're being respected (King and Delfabbro, 2019). Of course, responsibility isn't only on the developers' side. Players also need to check in with themselves from time to time. Am I spending more than I planned? Am I buying because I really want something, or just because I'm bored or frustrated? Research shows that players who are aware of their own habits — and take a moment to reflect — are less likely to get caught in impulsive spending cycles (Mills and Allen, 2020). It's also worth noting that healthy spending culture can't be built in isolation. Developers, players, and even policymakers need to work together to make gaming a place where people feel good about how

they play and what they spend. A little awareness on each side can go a long way in making games more sustainable and more rewarding for everyone (Griffiths et al., 2017). There's also a deeper layer to all of this. When we talk about spending in games, we're not just talking about money — we're talking about how the brain reacts to rewards, anticipation, and risk. Studies in neuroeconomics show that in-game purchases light up the same areas of the brain as other rewarding experiences, and this can make people more prone to buying without thinking it through (Wadsley et al., 2021). However, that also means we can design smarter. If developers understand how motivation, emotion, and brain chemistry work together, they can build systems that are exciting — but not manipulative. And if players understand it too, they can make choices that feel good in the long run.

5.4 Future trends and innovations in mobile gaming spending

The increasing prevalence of in-app purchases is a significant upcoming trend in mobile gaming expenditure (Chen and Lin, 2015). In-app purchases have emerged as a substantial source of income for game creators, enabling them to provide extra features, enhancements, or virtual items within the game. Developers have utilized in-app purchases to efficiently monetize their games due to the rising popularity of free-to-play games (Chen et al., 2020). Future projections indicate that this trend will continue as more gamers grow accustomed to the concept of real-money transactions in mobile games. One upcoming trend in mobile gaming expenditure is the rise of subscription-based gaming services (Tan and Chen, 2021). The way we spend money on mobile games is changing — and fast. Instead of buying individual games, more players are starting to pay a flat monthly fee for access to entire libraries of content, much like how we already use Netflix or Spotify. Subscription services like Xbox Game Pass or Apple Arcade are at the forefront of this shift, offering convenience, variety, and value. This approach doesn't just change how games are accessed; it also has the potential to reshape players' spending habits, especially in mobile gaming where microtransactions have long been the norm (Balland, 2021). At the same time, technology is pushing the boundaries of what games can offer — and how they make money. Augmented reality (AR) and virtual reality (VR) are no longer just futuristic ideas. These tools are becoming more common and are giving players entirely new ways to interact with game worlds. Imagine buying a digital outfit while trying it on in

real-time through AR, or unlocking premium levels in a VR setting that feels almost like a real adventure. These experiences don't just deepen engagement — they open up creative opportunities for in-game purchases and advertising (Hamari et al., 2023). Another exciting shift is happening through blockchain technology. This isn't just about cryptocurrencies — in gaming, blockchain means players can truly own the digital items they earn or buy. These assets — weapons, skins, characters — can be verified, traded, and even sold outside the game. Instead of purchases that vanish when a game ends, players now have assets that carry real, lasting value (Naik and Purohit, 2022). It's a major evolution in how we think about ownership and reward in digital environments. Put simply, the future of mobile gaming is being shaped by new tools, new models, and new expectations. Subscription-based access, immersive AR/VR experiences, and blockchain-powered economies are all part of a broader movement toward more flexible, engaging, and personalized spending experiences. For developers and players alike, understanding these trends means staying ahead of the curve — and shaping a gaming landscape that's not just profitable, but also more rewarding and dynamic.

CHAPTER VI: THE SIGNIFICANCE OF COMPREHENDING HIGH SPENDERS VERSUS LOW SPENDERS.

6.1 Thematic analysis of conversation with high spenders

6.1.1 Identifying key questions for high spenders

To comprehend the distinctions between big spenders and low spenders in the technology industry, a crucial step is to choose the appropriate inquiries to pose to high spenders. With the motto as "real people, real events", the author has tried every way to approach and interview the top 20 richest players in the game "Call Me Emperor" (CME), those who have spent at least $500,000 to deposit into the game. With the characteristics of the game world, these "rich players" refuse to reveal their real identities (and instead I only know them by their nicknames or game names). Through some exchanges, I learned roughly that most of them are between 25-45 years old, mainly working (or inheriting assets from their families) in 03 industries including high-end fashion, technology and financial services. Most of them are genuine heirs from wealthy families, and in addition to inheriting assets from their families, they also operate their own businesses. High spenders typically don't think and behave like the average person. As such, approaching this group of players is very specific and not easy, usually requiring "selection" based on certain professions and "environments", through introductions or being members of "groups", or indirect contact through their in-game "representatives". In general, with the common characteristics of players who can spend at least $500,000 on a game, their characteristics are usually: very busy, often "hire" others to play on their account, have high status in work (and many of them come from extremely wealthy families), like to show off their "exclusivity" and will only interact with people they consider "in the same world as them". Therefore, the only way to get in touch with this group of players is for the author himself to invest in the game and actually deposit money to upgrade his own in-game account, because only when the author's "status" is "high" enough, will he have the opportunity to "approach" the top 10 players in the game and interview them. An in-depth examination of discussions with individuals who make substantial purchases in certain sectors, such as fashion or technology, can provide additional insights into the disparities in buying patterns between high spenders and low

spenders. Through the identification of prevalent patterns and tendencies in the discussions of individuals who spend a significant amount of money, game producers may get vital understanding on the distinct tastes and actions of this particular group (Han and Kim, 2020). Subsequently, this data may be utilized to customize product offerings and marketing activities in order to more effectively cater to the demands and preferences of affluent individuals in certain sectors.

6.1.2 Conducting interviews with high spenders

Interviewing big spenders is an essential step in comprehending the motives and behaviors of this specific group of customers. High spenders are persons who are inclined to allocate a substantial sum of money towards acquiring items and services. Their purchasing choices can offer useful information for game producers seeking to target this profitable market. Developing a proficient interview guide for big spender research is crucial to ensure that the appropriate inquiries are made to reveal the motivations behind their purchasing patterns (Tynan, McKechnie and Chhuon, 2009). By then, the author expanded the scale of the interview, instead of the original 20 people, the author approached 50 people at the game of "Call me Emperor" (CME), who own accounts from VIP 12 to VIP 14 (according to the official figures published by the manufacturer CME, to achieve VIP 12 to VIP 14 accounts, players must deposit an amount ranging from $300,000 to $700,000). During the process of contacting this group of subjects to interview and collect information, the author of the thesis found that this is a group of subjects with extremely disciplined work ethic and not easy to approach. They are players with high positions and ranks in the game and their common characteristic is that they are not often "actually present" in the game. This means: They "hire" one or more other people to play the game on their game accounts, and they are mainly responsible for "depositing" money. When approaching them, the author of the article must make an appointment with their "in-game representative", and must present the purpose of making them "interested". In case the top player is "interested", they will respond to their "in-game representative" to discuss with the author of the article for 01 hour. Hence, what is the biggest reason why rich players are willing to spend from $300,000 to $700,000

on a game? While they can completely use that dream money to buy a house, buy a car, enjoy the most luxurious vacations? And of course, the answer is "beyond expectations":

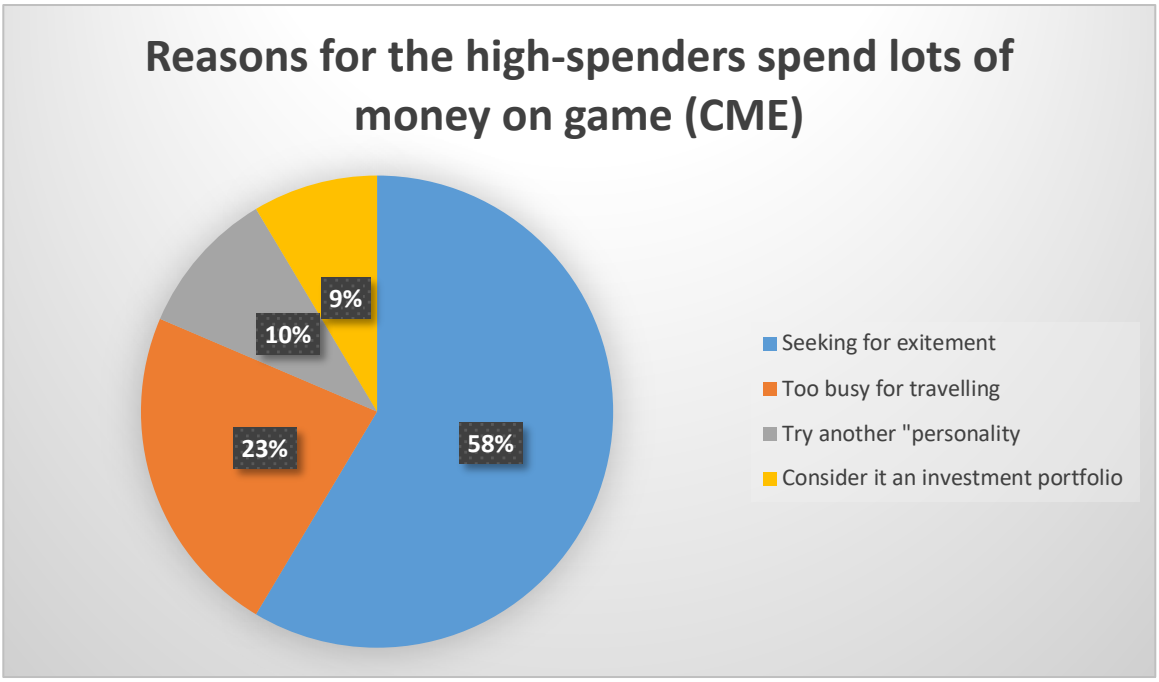

Figure 15. Reasons for the high-spenders spend lots of money on game (CME) (Source: by author,2024)

An effective strategy for conducting interviews with high spenders is to also get valuable ideas from interactions with budget-conscious low spenders. Looking at the chart above, we realize that most of the rich players feel that success comes to them too "easy", or they are born into a situation where they can "achieve everything" when they accept to follow the available path from their family. Thus, when this "available path" is repeated for years or decades in their lives, they want to find a new feeling and "stimulate" their somewhat "boring" life, and that is the reason for them to spend money on CME to seek for excitement with around 58%. In other words, the rich people here spend money to buy back "happiness" or the feeling of "fun". Along with this reason, the group of rich players are completely tied to their office, and they don't have time to travel, and therefore, they are willing to spend money on games instead of enjoying traveling, and also because they already have a lot of houses, cars and luxury items, and instead

of having to choose between "spending money on luxury items" or playing games, they simply choose "both options". This group of players has to live too long in a predetermined environment, and they want to find a world completely different from the world they are living in, to test a "different personality of themselves" in the game. All of these reasons form the habit of investing money into game characters of the rich players, and they really consider investing money into games as a calculated investment decision of theirs with the investment value achieved being that they successfully build a "different personality" in "another world". By then, the author of the thesis can understand that, for rich players, the decision to "top up" their game is not a "spontaneous" decision at a time, but a "serious investment" with a long-term strategy, when aiming for the result of the investment is "buying happiness with money" and they are proud when they "have enough money to buy happiness". Clearly, this is a group of players who are used to topping up as a "habit", and in terms of psychology, it is a tendency to "show off their ultimate power". Therefore, with this group of "rich" players, we cannot use social or psychological reasons of ordinary people to interpret, but we must use the neural reflexes (presented in part 2 of the thesis) to interpret the neural reflexes of this group of players and their "game addiction". Players who spend a significant amount of money have embraced their "profession" and invested heavily in their in-game characters. The strategy for this group of wealthy players is that game publishers must produce factors that stimulate interaction between players' fingers and screens, and at the same time provide many tasks in the game, to stimulate this group of players to "invest" more in the game. (Mehr, 1994).

6.2 Development of interview guide: approaching interview with low spenders

When conducting interviews with individuals who spend less in the technology industry, it is crucial to have a different mentality compared to when interviewing those who spend more. Individuals who spend less money are typically more mindful of their budget and may priorities their shopping selections differently. In order to efficiently obtain valuable information from these individuals, it is essential to create an interview guide that is customized to their unique requirements and preferences. An important distinction between interviewing those who spend a significant amount of money and those who spend less is the extent of specific

information that may be necessary in the inquiries posed. Individuals who spend less money may priorities price and value for money. Therefore, it is crucial to inquire about their decision-making process when it comes to buying something (Hidayah and Idris, 2020). To better understand the thought process and decision-making of low spenders in the gaming industry, it is important to ask questions that focus on their budgeting. As the author's purpose is to create a game model that is easy to popularize to many players and understand the psychological responses of low-spending players, through stimulating the interaction between the player's fingers and the screen. The author has coded a simple English vocabulary learning game, named "Verba", with the database presented in detail in section 5. The author has tested the game at the author's own company, with more than 100 people including the author's employees and students, and interviewed them and recorded the interview results. In general, the subjects that the author interviewed ranged from 25-60 years old, with 70% of them being female, and most of them were married with 1-2 children. From this we can understand the reasons that attract low-spender players to download the game and engage in the game more:

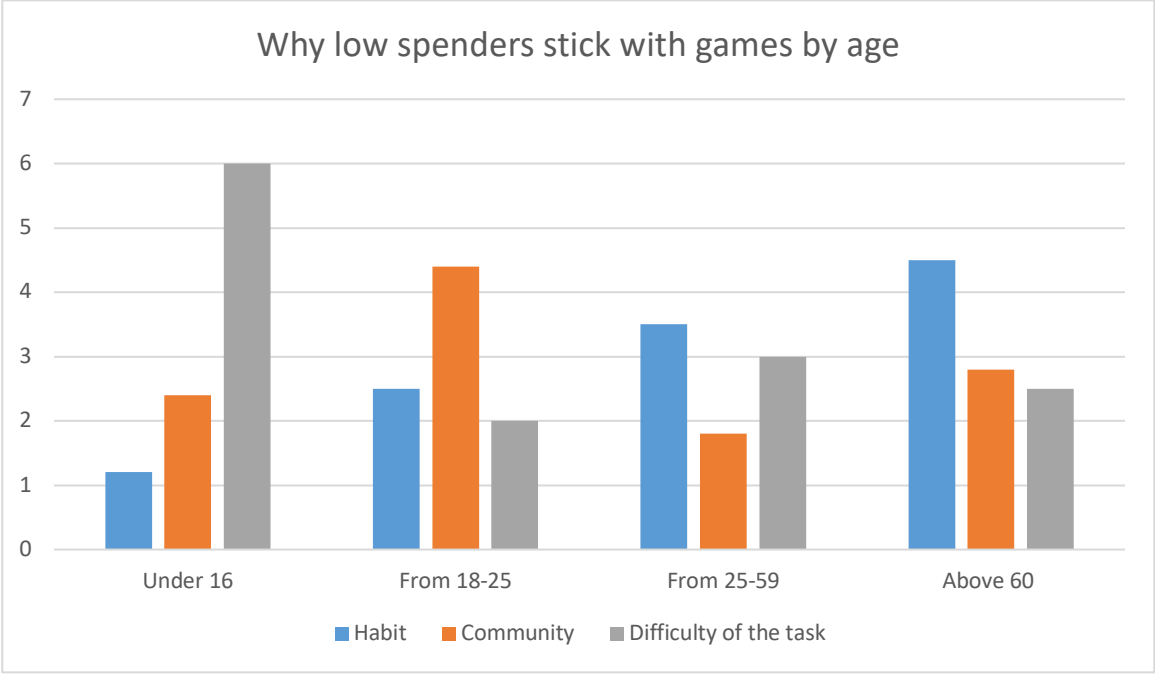

Figure 16. The reasons for the low-spenders to be loyalty with the games by age (Source: by author,2024)

Looking at the diagram, we can easily see that, for people under 16 years old, the attraction for them to stay in the game is due to the "difficulty" of the tasks they need to perform, requiring many combined skills and excellent reflexes, while for the group of people from 18 to 25 years old, they often have the habit of playing games to connect with the community and expand their friendships in the game. For the group of people in the "old age", from 25 years old and up, they consider games as a "habit of life" of theirs, and a habit to maintain regularly. Given that the survey subjects are typical employees of the author's company, it is understandable that they turn to mobile games as a "factor" to distract themselves from the real world. Compared to the players who pay a lot of money, who are willing to have professional strategies and seriously invest in the game, the group of players who do not spend money will mostly play by instinct and habit, as a way to "kill time" in the boring office life. Besides, this is a group of people who do not have "loyalty" to the game, because they can play many different games at the same time. Thus, for the group of players who spend little money and almost never deposit money into the game, the goal of the author of the research, as well as of game publishers, is to create a game that stimulates the "little audience" to download a lot, and must include the following elements: Simple, easy to popularize, repetitive in terms of the tasks given in the game, and repetitive difficult tasks that require flexible combination between fingers and screen.

6.3 Comparative analysis of high and low spender data

Understanding these differences can help game producers optimize marketing methods and game features, effectively targeting and engaging both sectors of the market. Low spenders' financial conditions are also a significant factor in their shopping behavior, as they may have limited income or financial obligations that prevent frequent or substantial transactions. Understanding these economic limitations can help game publishers create more appealing price alternatives and promotional strategies. Furthermore, those who spend less money may possess distinct motives for engaging in gaming activities in contrast to those who spend more. High spenders tend to prioritize obtaining in-game prizes and advancing rapidly through levels, whereas low spenders may prioritize social connections, relaxing, or simply enjoying the gameplay experience. By acknowledging these distinct motives, game producers might create characteristics that specifically appeal to individuals who spend less, such as including social elements, offering

customization choices, or emphasizing plot and immersion. Understanding the motivations of low spenders in gaming is crucial for game publishers as it allows them to broaden their target audience and optimize their marketing strategies (Hamari et al., 2017). It is found that social interaction and giving virtual goods to others were strong factors associated with higher spending among players, as mentioned in the sources. In addition to economic limitations and distinct motivations, the social aspects of gaming also play a significant role in spending disparities between high and low spenders (Cai et al, 2019). As mentioned in the sources, social interaction and giving virtual goods to others were found to be strong factors associated with higher spending among players (Cai et al., 2019). The online game industry is currently experiencing a significant rise in popularity, with more and more people engaging in gaming activities (Hamari et al., 2017). By examining the disparities in purchasing patterns, game producers can customize their marketing communications, pricing tactics, and game attributes to effectively attract both market segments. Furthermore, studying the motivations of low spenders can contribute to a better understanding of the factors that discourage or hinder spending on in-game purchases. This understanding can assist in developing strategies to overcome these barriers and increase revenue from low spenders. Furthermore, understanding the motivations of low spenders can also shed light on potential opportunities for monetization within the gaming industry (Cai et al., 2019).

CHAPTER VII: DISCUSSIONS & CONCLUSION

7.1 Discussion

7.1.1 Overview of findings

Individuals with high spending tend to be early adopters of new products, driven by their loyalty to specific brands and status symbols. Also, high spenders prioritize staying updated with technological advancements and high-quality items, while low spenders are more budget-conscious and prioritize practicality and affordability. On the other hand, those who spend less are more focused on practicality and value for money, not easily influenced by marketing strategies or current trends. The study also revealed that those who spend a lot are more impulsive and willing to pay extra for convenience and luxury, while those who spend less are more systematic in their buying decisions (Zendle et al., 2023). Affluent consumers in sectors like fashion and technology prioritize exclusivity and personalization, willing to pay more for items that cater to their unique preferences. This research underscores the importance of understanding these disparities in purchasing decisions for game creators, general readers, and players. By creating well-designed interview guides, analyzing interviews with cost-conscious individuals, and performing comparative and thematic analysis, game publishers, general readers, and players can gain valuable insights into purchasing behavior, which can be used to tailor strategies and better meet the needs of their target audience.

7.1.2 Implications for understanding gaming expenditure patterns

7.1.2.1 Policy implication for regulatory bodies

The study of spending disparities between high and low spenders in gaming has several implications for understanding gaming expenditure patterns. Researchers and politicians have shown significant interest in studying the neurophysiology of gaming addiction in recent years. Regulatory organizations are investigating the policy implications of excessive gaming and its effect on individuals' spending behavior, due to the increasing awareness about this issue (Wegmann and Brand, 2018). Understanding the spending patterns of high and low-spenders in gaming can provide valuable insights for game creators, players, and decision-makers in terms of policy implications

and regulatory measures. For game creators, understanding the spending patterns of high and low spenders can help to optimize game design and monetization strategies (Hanner and Zarnekow, 2015). With this knowledge, creators can tailor their games to cater to different spending habits and effectively maximize profits. Regulatory organizations should prioritize raising awareness and providing education on the neurophysiology of addiction in gaming. Gaining insight into the psychological reasons that underlie excessive expenditure in gaming is essential for formulating efficacious strategies. Regulatory organizations can educate game players about the possible consequences of addictive behavior and promote safe gaming practices through public awareness initiatives (Király et al., 2017). The regulation of in-game purchases and micro-transactions is crucial due to neuroeconomic studies showing that psychological processes like instant gratification and fear of missing out can lead to excessive gaming spending. Regulatory authorities should collaborate with game producers to ensure transparent transactions and informed players about the financial consequences of their choices (Islas Sedano et al., 2013). They can also stimulate research in game design to reduce excessive spending and promote responsible game design techniques, such as expenditure monitors, time limitations, and instructional components that educate players about the consequences of excessive gaming spending. Additionally, understanding the spending patterns of high and low spenders in gaming can also benefit players themselves.

7.1.2.2 Establishing guidelines for in-game purchases

Currently, in the realm of gaming, the inclusion of in-game purchases has become a prevalent characteristic that enables gamers to augment their gaming experience or advance more rapidly. Nevertheless, the increasing prevalence of these micro-transactions has also sparked apprehension over their possible influence on gamers' expenditure patterns. It is essential for game publishers, players, and leaders to comprehend the neuroeconomic aspects that influence spending on gaming and to create standards that promote a healthy gaming environment for everyone. The study of the neural mechanisms behind addiction in gaming has received considerable interest in recent years. Research has demonstrated that specific gaming mechanics and reward systems may stimulate the release of dopamine in the brain, resulting in sensations of pleasure and motivation. This neurophysiological reaction

can initiate a cycle of addiction, when players feel an irresistible want to expend money on in- game transactions in order to maintain those enjoyable sensations. (Wohn, 2014). Through comprehending these principles, game producers may create games that captivate players without taking advantage of their susceptibilities. Furthermore, understanding the psychological factors that drive differences in spending habits between high and low spenders in gaming is crucial. Neuroeconomic studies have provided insights into the psychological processes underlying both excessive and little expenditure in gaming. Individuals who exhibit higher levels of impulsivity are more likely to engage in excessive spending on in-game goods (Chinomona, 2013). By acknowledging these distinct variations among individuals, game producers may customize their games and price structures to guarantee equitable and conscientious monetization. Moreover, comprehending the psychological determinants behind reduced expenditure might aid in recognizing possible obstacles to involvement and formulating tactics to surmount them. The establishment of criteria for in-game purchases requires the involvement of game publishers, gamers, and gaming community leaders. Game publishers should prioritize transparency by providing clear information on transaction nature and monetary value. This helps players make informed decisions and prevents impulsive spending. Implementing spending limitations or parental controls can protect vulnerable groups. Players also play a crucial role in shaping rules and regulations, shaping ethical monetization techniques through feedback and participation. Game producers should prioritize a player-centric strategy for equitable and enjoyable gaming experiences. Ultimately, the implementation of regulations for in-game transactions is an essential measure to foster a fair and well-functioning gaming atmosphere. To develop games that engage players responsibly, game producers may utilize their understanding of the neurophysiology of addiction in gaming and the psychological factors that drive spending behaviour (Siu Lam, 2020). Effective collaboration among game producers, players, and leaders is crucial for promoting openness, making well-informed decisions, and safeguarding vulnerable populations. Through collaboration, we can cultivate a gaming sector that not only provides amusement but also enhances the welfare of gamers

7.2 Theoretical contributions

7.2.1 Collaborative effort between game publishers and general readers

The gaming industry is experiencing significant growth, necessitating collaboration between game producers, gamers, and leaders. This chapter highlights the importance of these collaborations in understanding and addressing the neuroeconomic aspects of gaming expenditure. The study of addiction in gaming and its connection to spending behavior has gained significant attention, and game publishers play a crucial role in developing engaging games and understanding the psychological principles that influence addiction and consumer buying patterns. Collaboration with neurophysiologists and psychologists can provide valuable insights into the decision-making processes and cognitive biases that affect players' spending behavior (Brand et al., 2019). Game publishers can also conduct neuroeconomic studies on the psychological processes underlying excessive and minimal gaming expenditures, which are essential for developing successful revenue generation techniques. Leaders specializing in neuroeconomics can offer valuable insights into the decision-making processes and cognitive biases that affect players' spending behavior. By working together, game producers can create games that cater to the varied spending preferences of players, ensuring a more enjoyable gaming experience (Braeutigam, 2005). Collaborative efforts between game publishers and prominent leaders can also extend beyond research and development, enabling the development of educational projects and awareness campaigns aimed at both gamers and the public. This can enhance players' understanding of the psychological factors influencing spending behavior and encourage responsible gaming habits. Additionally, collaborations between game producers and players can promote transparency and open communication, allowing for the development of games that prioritize player well-being while still being profitable. In conclusion, the partnership between game publishers and leaders is vital for investigating the neuroeconomic aspects of gaming expenditure, enhancing understanding, creating efficient monetization strategies, and advocating for responsible gaming practices.

7.2.2 Limitations of the study and potential biases

This study aims to provide insights into the discrepancies in expenditure within the mobile gaming industry, but it is crucial to acknowledge and consider the limitations of the findings. The study's limitations include the small

sample size, potential selection bias, self-reported data, generalizability, social desirability bias, and temporal limitations. The small sample size may limit the generalizability of the findings, as participants were not randomly selected, which could distort the results. Participants voluntarily provide self-reported data, potentially leading to recall bias or misunderstanding (Hilgard et al., 2013). Generalizability is also a concern, as the findings may not be easily transferable to different situations or genres of games beyond the mobile gaming sector. Social desirability bias can result in underestimating real expenditures or hesitancy to provide sensitive data, impacting the precision of the findings. Another issue is the study's temporal limitations, which may not fully capture the constantly evolving nature of mobile gaming and its expenditure patterns. Volatility of market trends, player behaviors, and technical improvements can lead to quick changes that may affect the accuracy and significance of the findings (Lestari and Andrianto, 2020). Despite these limitations, the study's objective is to provide insight into the discrepancies in expenditure within the mobile gaming industry. By considering these elements, game publishers, gamers, entrepreneurs, and general readers can analyze the findings discerningly and make well-informed decisions based on the insights presented.

7.3 Future research directions

Neuroeconomics is a rapidly growing field that offers new opportunities to study the neurophysiology of gaming addiction and its connection to spending patterns. As the number of people participating in gaming activities continues to rise, it is crucial for game creators, players, and leaders to understand the fundamental aspects that influence expenditure in gaming. Future research in this area has significant potential benefits for game companies, gamers, and leaders in general (Zhang and Huang, 2019). One area of study that shows promise is to further explore the neurophysiology of addiction in gaming. Researchers can uncover specific neurological pathways and mechanisms that lead to gaming addiction by analyzing the brain activity of individuals who display addicted behaviors towards gaming (Fauth-Bühler and Mann, 2017). Gaining a comprehensive understanding of these neurophysiological processes can assist game producers in creating gaming experiences that are more accountable and morally upright, while also equipping players with resources to control and regulate their spending habits.

Another crucial field of future inquiry is the neuroeconomic exploration of the psychological factors underlying excessive and minimal expenditure in gaming. Researchers can discover the cognitive biases and heuristics that influence spending behavior by examining the decision-making processes players go through while making in-game purchases (Sifa et al., 2021). Game producers may utilize this insight to create games and monetization techniques that are in line with players' interests, resulting in a more enjoyable and captivating gaming experience. In addition, future studies should explore the enduring effects of excessive expenditure on gaming activities on individuals' financial stability and psychological well-being (Oksanen et al., 2018). By analyzing the correlation between gaming expenditure patterns, indebtedness, and psychological distress, researchers can provide insights for developing policies and interventions that attempt to alleviate the adverse consequences linked to excessive spending in gaming. By then, researchers should focus on creating a well-designed interview guide for doing high spender research. This helps game publishers customize their marketing tactics to more effectively target this specific group of customers. Also, researchers should investigate methods for extracting valuable information from interviews conducted with individuals who prioritize budget-conscious spending. By understanding the mentality of this demographic, video game makers may recognize prospects to allure and maintain these consumers, potentially augmenting their portion of the market. And, researchers should prioritize examining the disparities in purchasing behavior between high spenders and low spenders to pinpoint crucial areas for enhancing marketing tactics. By focusing on these crucial areas, future research in the technology sector can enhance their understanding of buying behavior and offer significant insights for game creators, general readers, and players. Moreover, future studies should investigate the influence of social and environmental elements on consumer behavior in relation to gaming expenditure. Researchers can develop a thorough knowledge of the external elements that influence players' purchasing patterns by examining the impact of peer pressure, societal norms, and marketing techniques. This understanding can assist game publishers in formulating ethical marketing techniques and executing initiatives that encourage players to make educated decisions. Lastly, future research might explore the enduring effects of excessive spending on gaming on individuals' financial stability and mental well-being (von der Heiden et al., 2019). By analyzing the correlation between gaming

expenditure patterns, indebtedness, and psychological distress, researchers can provide insights for developing policies and interventions that attempt to alleviate the adverse consequences linked to excessive spending in gaming. Thus, we can draw the following market research process for games:

1. Understanding motives: By analyzing motives, game publishers can tailor their revenue generation strategies and game development to cater to different player demographics which help them create more inclusive and captivating gaming experiences.

2. Investigating psychological variables: Understanding the psychological factors that influence spending habits in mobile gaming, such as social influence, self-esteem, and success drive, can help game producers promote responsible spending while delivering a satisfying gaming experience.

3. Examining game design components: The design components of mobile games directly influence player spending. Analyzing the correlation between specific game design components and expenditure patterns can provide valuable insights for game developers.

4. Investigating demographic disparities: Understanding demographic variables like age, gender, and socioeconomic position can help game publishers develop targeted marketing efforts and customized gaming experiences.

5. Assessing the effects of regulations: With increasing government and regulatory involvement in the mobile gaming industry, it is crucial to analyze the impact of laws on spending discrepancies. This information can influence future legislation and industry standards.

By conducting these studies, game producers, players, entrepreneurs, and general readers can gain a comprehensive understanding of spending disparities in mobile gaming, leading to more inclusive and captivating gaming experiences. Resolving and closing the gap in expenditure will contribute to a flourishing and enduring mobile gaming business.

7.4 Conclusion:

This thesis explores the discrepancies in spending patterns among mobile gamers, focusing on the factors that influence their purchasing decisions. The research reveals that there is a significant difference between high spenders and low spenders in the mobile gaming industry. High spenders, also known as "whales," contribute significantly to the overall income while low spenders contribute less (Wawro, 2023). Understanding these differences is crucial for game producers to maximize their monetization strategies. The study highlights the impact of gameplay experience on purchasing behavior, with those who spend more money investing in games with social and competitive elements, such as virtual reality or augmented reality. Conversely, those who spend less money tend to prioritize playing free-to-play games and make infrequent little purchases rather than large financial commitments (Marker and Staiano, 2015). The study also examines the influence of in-app purchases on consumer purchasing patterns. Those who spend more money are more inclined to make frequent and substantial in-app purchases, often motivated by the desire to gain a competitive advantage or advance more quickly in the game (Ravoniarison and Benito, 2019). On the other hand, those who spend less money are more careful with their expenses and typically use free or inexpensive options to improve their gaming experience. The research also uses neuroscience research to understand gaming addiction among players. Extensive neuroscientific research has revealed that gaming stimulates the brain's reward system, leading to the release of dopamine and generating feelings of pleasure and motivation (Balakrishnan and Griffiths, 2018). This heightened level of reward sensitivity can result in addictive behaviors, where players may feel forced to increase their spending on in-game purchases, upgrades, and subscriptions. Game publishers must be aware of the potential addictive qualities of their games and employ appropriate revenue generation methods to safeguard the welfare of their players. The neuroeconomic research reveals the psychological processes underlying both excessive and little expenditure in gaming. It identifies many elements that influence spending behavior, such as social influence, personal motivation, and in-game marketing. By understanding these mechanics, game publishers can customize their marketing tactics to efficiently target certain player categories and enhance their awareness of their personal spending habits (Fang et al., 2019). A notable discovery is that those with elevated levels of impulsivity are more prone to engaging in excessive spending on gaming. This emphasizes the importance of self-control and

conscientious gaming behaviors. Game producers can incorporate elements that encourage self-discipline and prohibit excessive expenditure, such as setting limits on spending, imposing time limitations, or displaying pop-up reminders. Lastly, the research indicates that the existence of virtual economies in games impacts spending behavior. Players who consider in-game purchases as investments or marks of status are more likely to spend more, while those who regard them as superfluous or unjust are more prone to spending less (Cheung et al., 2015). Gaining insight into these psychological motivators can help game developers create monetization tactics that align with players' views and preferences.

APPENDIX A: SURVEY COVER LETTER

Subject: You are invited to a research survey – **Spending disparities between high and low spenders in gaming – case study "Call me mperor"**

Dear Sunwah English Education Staffs:

You are invited to participate in a research study titled "Spending disparities between high and low spenders in gaming – Case Study: Call me Emperor". This study is being conducted by Dr.Pham Minh Phuong (widely known internationally by her English name as Dr.Felicia Pham), our Managing Partner (CEO). The present research available concerning the factors that was undertaken to uncover the underlying factors contributing to the remarkable success of the gaming business, particularly in the realm of mobile games. The purpose of this study is to find out what motivates players to spend money in their favorite games, find out what influences their in-game spending patterns, and at the same time propose a game model product that attracts players and creates a difference from traditional concepts. Additionally, this is for the research of educational technological game product under the copyright of Dr.Felicia Pham, and will be released at Sunwah English Education in 2025.

In this study, you will be asked to complete an surveys and interviews from our HR Department. Your participation in this study is voluntary and you are free to withdraw your participation from this study at any time. The survey should take only 30 minutes to complete.

This survey has been approved by the Board of Director from Sunwah English Education. There are no risks associated with participating in this study. The survey collects no identifying information of any respondent. All of the response in the survey will be recorded anonymously.

As this is a research for the release of a new product by Sunwah English Education, all 100% of employees in the company are encouraged to participate in the survey and gain direct benefits such as adding points to the year-end reward level.

If you have any questions regarding the survey or to contribute ideas to this research project in general, please contact

Dr.Pham or his/her assistant at the email address: felicia.pham@sunwaheducation.com. If you have any questions concerning your rights as a research participant, please contact the HR Department by replying this email.

By completing this survey, you are indicating your consent to participate in the study. Your participation is appreciated.

HR Department - Sunwah English Education.

APPENDIX B: INFORMED CONSENT

You have been asked to participate in a research study to support the launch of a new product by Sunwah English Education. As this is our company's first ed-tech product in 2025, and marks our company's investment in ed-tech, we expect 100% of our employees to participate and provide feedback.

You may choose not to participate in this study or you may choose to leave the study at any time. Deciding not to participate, or deciding to leave the study later, will not result in you being penalized or losing the benefits you would have had if you had not participated in the study, and will not affect your relationship with the researchers or their employers.

Before you agree to participate, the researchers will summarize important information to help you decide whether to participate. The researchers will then tell you about the study, including:

• Why the study is being done

• How many people will be in the study

• What happens in the study, including how long you will be in it and whether it involves any experimental procedures

• Any risks or benefits you may have or get

• Any treatment options other than taking part in the study

• How your information will be protected, and how your information may be used in the future

• How you will be told about new research findings that may affect you and your participation

• Who will pay for your treatment if you get injured during the study

• Any costs you will need to pay, and whether you will be paid for taking part in the study

• What happens if you decide to stop taking part, or any reasons why service providers may end your participation in the study

If you have questions about your rights as a research participant, want to talk about problems, complaints or concerns about a study, or if you would like to learn more or provide comments, please contct the HR Department with the above information.

PARTICIPANT CONSENT

This study, including the information listed above, has been presented to me orally and I agree to participate in this study. I will receive a copy of this signed consent form and English version of the Informed Consent for my records.

I agree to participate in this study.

Name of Participant:

Signature of Participant:

Date

APPENDIX C: THE GAME EVALUATION QUESTIONNAIRE FOR THE ANALOG/DIGITAL GAME

These sections will need to be filled in at different phases of the experimentation (before the experiment, after having experienced each game, after finishing the experiment), and are aimed at gathering valuable feedback with regard to key aspects. The purpose of each questionnaire can be inferred from its title, but may also briefly indicate for better clarity.

Q1. Demographic Information Questionnaire

This form is used to gather background information about participants for the experiment. The data will be anonymized and only be used for research purposes.

Demographic Information	Employee Id: (To be Indicated by the Experimenter)
Name and Surname:	e-mail:
Age:	Gender: Male / Female / Prefer not to indicate
How often do you play digital games?	Never Rarely: from time to time Monthly: at least once a month Weekly: at least once a week Daily: every day.
How proficient are you in using computers?	Novice Intermediate Advanced
What type of device do you use for playing digital games? [Select all those that apply]	Computer device Gaming console device Handheld gaming device Mobile devices (smartphones, tablets) AR headsets VR headsets

What's your experience with Virtual Reality (VR) / Augmented Reality (AR) systems?	I have never used them before I have some experience I am very experienced
How often do you play non-digital games (card or board games, etc.)?	Never Rarely: from time to time Monthly: at least once a month Weekly: at least once a week Daily: every day.
Do you have any visual or hearing impairments?	No (if you see and hear well with aids, indicate No) Yes. Optionally you can indicate what the impairment is: ____

Do you have any physical impairment?	No Yes. Optionally you can indicate what the impairment is: _____

Q2. Before the Gaming Experiences – Interest and Previous Experience

This initial questionnaire aims at collecting initial feedback about the awakened interest by gamified touristic experiences, as well as whether the participants have previously experienced similar games

Section 2.1

Please, select an option according to how much you agree or disagree with each statement in each of the sections below.

General Questions about Awakened Interest

Statements	Select an option as your evaluation				
	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
The gamification of English learning Vocabulary attracts my interest					
I think games are a useful tool to get richer knowledge about learning English vocabulary					
The availability of games about learning English vocabulary can attract further learners					
I would participate in gamification experiences for learning English Vocabulary, if available					

Section 2.2

Do you have previous experience in gamified learning English vocabulary?

- No
- Yes. If that is the case, please indicate for how much vocabulary (___) and what these gamified experiences consisted of:

_____

Q3. Questions after each Gaming Experience

After each gaming experience, the participants will need to fill in a series of questionnaires to assess different relevant aspects of the game itself, the perceived experience, and the potential impact of the game.

These series of questionnaires will be repeated after having experienced each game in order to gather specific feedback for all of them, and then be able to compare the results. We do thank you in advance for your patience and willingness to help us in this process.

The questionnaires are labeled as 3.X.Y, where X reflects the id of the game they refer to (e.g. X=1, 2, 3; if participants will test 3 games), and Y reflects the id of the questionnaire included in this stage of the experiment. Accordingly, only one iteration of the questionnaires is provided below, and these iterations would need to be repeated for each game under test upon having decided the number of games to be tested by each user.

SUS Questionnaire [10%]

This is a short and widely adopted questionnaire to assess the usability of the game. Please, select an option according to how much you agree or disagree with each statement in each of the sections below.

SUS Questionnaire					
Statements	Select an option as your evaluation				
	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
I think that I would like to use this game frequently					

I found the game unnecessarily complex					
I found the various functions / stages in this game were well integrated					
I would imagine that most people would learn to play this game very quickly					

NASA Task Load Index (TLX) Questionnaire [10%]

This is a short and widely adopted questionnaire to rate your workload of the task and overall experience in the game on a 7-point scale. Increments of high, medium and low estimated for each point result in 21 gradations of the scale.

TLX							
Statements	Degree						
	1	2	3	4	5	6	7
How mentally demanding was the gaming experience/task?							
How physically demanding was the gaming experience/task?							
How hurried or rushed was the pace in the game?							
How successful were you in accomplishing what you were asked to do?							
How hard did you have to work to accomplish your level of performance?							

How insecure, discouraged, irritated, stressed and annoyed were you?							

IPQ (IGroup Presence Questionnaire) [Optional: only if it was a VR Game]

In case of experiencing a VR game, participants will additionally be provided with this short and widely adopted questionnaire to determine their level of immersion in the gaming experience.

IPQ							
Statements	Degree						
	1	2	3	4	5	6	7
How aware were you of the real world during the VR experience							
How real was the virtual world?							
I had the sense of acting in the virtual world							
I did not feel present in the virtual world							
I was not aware of my real environment							
The virtual world seemed more realistic than the real world							
I felt like I just was perceiving images							

Ad-hoc Game Experience Questionnaire [30%]

This questionnaire aims at gathering valuable feedback about extra relevant aspects of/about the game, like: playability, attractiveness, complexity, involvement, story line, awakened interest, etc.

Please, select an option according to how much you agree or disagree with each statement in each of the sections below.

Game Experience					
Statements	Select an option as your evaluation				
	Strongl y disagree	Disagree	Neither dis/ agree	Agree	Strongl y agree
The game design is attractive					
The game rules are clear and easy to understand					
The game objectives are clear and easy to understand					
The game captured my attention rapidly					
The material/devices provided are adequate					
The game evolution (content, phases, storyline) is coherent					
The game story line can be easily understood					
The game complexity levels are adequate					
I felt involved in the game experience					
I think the games provide delightful surprises (e.g. hidden stories, rewards, unexpected events…)					
The game duration is adequate					

I think the game is unique or original					
I liked the game					

Specific Ad-hoc Questions [Optional]

Please, list two/ three strong aspects or benefits of the game:

Please, list two/ three weak aspects or limitations of the game:_____

Please, add any further comment or suggestion, if you wish:_____

Net Promoter Score (NPS)

To what degree would you recommend this game to someone else. (0 to 10)

Game Design Document (GDD) Evaluation Questionnaire [30%]

This questionnaire aims at evaluating to what extent the Game Design Document (GDD) guidelines and objectives are met, as well as the level of quality of specific related sections/aspects to be included in GDD.

GDD Evaluation					
Statements	Select an option as your evaluation				
	Strongly disagree	Disagree	Neither dis/ agree	Agree	Strongly agree
Part 1. The GDD Game Overview includes the appropriate information about the game theme, objectives and target users in a clear manner					

Part 1. The GDD Game Overview includes the appropriate information about the main details of the game (context, technology, creative aspects, mechanics…)					
Part 2. The GDD Game Detailed Description includes the appropriate information about technological aspects					
Part 2. The GDD Game Detailed Description includes the appropriate information about creative, art and content related aspects					
Part 2. The GDD Game Detailed Description includes the appropriate information about the game storyline, flow, mechanics and tasks to be performed.					
Part 2. The GDD Game Detailed Description includes the appropriate information about the (planned) evolution of the game development					

Part 3. The summary of the game with regard to technological aspects is appropriate					
Part 3. The summary of the game with regard to territorial aspects is appropriate					

Part 3. I felt involved in the game experience (i.e. focused on the task(s) at hand to complete the game)					
Part 3. I feel the game stimulated my curiosity and creativity					
Part 3. I forgot about my immediate surroundings while playing this game.					

3.1. Questionnaire on Socio-Economic Aspects [20%]

Socio-Economic Aspects					
Statements	Select an option as your evaluation				
	Strongly disagree	Disagree	Neither dis/ agree	Agree	Strongly agree
The game experience is linked to the associated English Vocabulary					

The game experience boosted my interested in knowing more about the related English Vocabulary					
I am satisfied with the things I learned about the English Vocabulary thanks to the game					
The game can be played by everyone					
The game is adequate for players of different ages					
The game is adequate to all genders					
The game is appropriate for users with audiovisual accessibility needs					
The game is appropriate for users with physical (e.g. mobility) accessibility needs					
The game can be enjoyed with other people also participating in it					
The game requires expensive or very specific material to play it					
The game is environmentally friendly					
The game indirectly involves performing healthy exercise					
I would buy, or pay to experience, games like this one (within reasonable costs)					

I am likely to recommend this game to others					

Q4. Questions after all Gaming Experience

After having experienced all games, the participants will need to fill in a final questionnaire to assess their level of satisfaction, as well as the awakened interest and potential of gamification of touristic destinations.

Questions after all Gaming Experience					
Statements	Select an option as your evaluation				
	Strongly disagree	Disagree	Neither dis/ agree	Agree	Strongly agree
I think the availability of these kinds of games becomes a useful tool to get richer knowledge about English Vocabulary					
I like learning about English Vocabulary through gamified experiences					
The overallgaming experiences fulfilled my expectations					
In general, I am satisfied with the overall gaming experiences					
The availability of these kinds of games about English Vocabulary can help in attracting learners					

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