COMPARATIVE ANALYSIS OF VIRTUAL GAMES WITH VIDEO GAMES: PREFERENCES OF PLAYERS WORLDWIDE

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ISTANBUL, 2023

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SUBMITTED TO GRADUATE SCHOOL OF SOCIAL SCIENCES

IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE OF MASTER

IN

DEPARTMENT OF VISUAL COMMUNICATION DESIGN

YEDITEPE UNIVERSITY

GRADUATE SCHOOL OF SOCIAL SCIENCES

ISTANBUL, 2023

PLAGIARISM

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Date: 28.08.2023

Salah Eddine AHTAQ

ABSTRACT

The emergence of virtual reality in recent years has primarily focused on user interfaces, visual simulation, and 3D graphics. However, the community's interest in virtual reality has shifted towards the gaming industry in order to reach a larger audience. This thesis aims to study the differences and similarities between virtual games and traditional video games in order to determine user preferences and opinions. Over 60 days (April 1st - May 31st, 2023), an online survey gathered 300 comprehensive responses, revealing substantial insights, and 4 interviews have been conducted with 4 volunteers from different countries.

Combining quantitative insights gleaned from the survey and qualitative richness drawn from the interviews, the study explores the multifaceted realm of user perceptions and inclinations. This combined approach crafts a nuanced perspective on gaming preferences within these distinct yet interconnected realms.

Keywords: Video Gaming; Virtual Reality; Virtual Gaming; Game players

ÖZET

Sanal gerçekliğin son yıllardaki ortaya çıkışı öncelikle kullanıcı arayüzlerine, görsel simülasyona ve 3D grafiklere odaklanmıştır. Ancak sanal gerçeklik alanındaki topluluk ilgisi, daha geniş bir kitleye ulaşmak amacıyla oyun endüstrisine kaymıştır. Bu tez, sanal oyunlar ile geleneksel video oyunları arasındaki farkları ve benzerlikleri incelemeyi ve kullanıcı tercihlerini ve görüşlerini belirlemeyi amaçlamaktadır. 1 Nisan - 31 Mayıs 2023 tarihleri arasında 60 gün boyunca çevrimiçi bir anket, hedeflenen katılımcı grubundan 300 kapsamlı yanıt toplamış, böylece önemli görüşleri ortaya koymuştur ve farklı ülkelerden 4 gönüllü ile 4 görüşme gerçekleştirilmiştir.

Anketten elde edilen niceliksel verilerin ve görüşmelerden elde edilen nitel zenginliğin birleştirilmesiyle, bu çalışma kullanıcı algıları ve eğilimlerinin çok yönlü alanını keşfeder. Bu birleşik yaklaşım, bu farklı ancak birbiriyle bağlantılı alanlarda oyun tercihleri konusunda nüanslı bir perspektif sunar.

Anahtar kelimeler: Video Oyunları; Sanal Gerçeklik; Sanal Oyun; Oyuncular

To my beloved mum, dad, and cherished wife Fatima-Zahra, whose unwavering support, love, and encouragement have been the guiding lights illuminating my academic journey.

ACKNOWLEDGMENTS

I would like to express my deepest gratitude to all those who have supported me throughout the journey of completing this thesis.

First and foremost, I am immensely grateful to my supervisor, Prof. Dr. Neda Üçer, for her guidance, expertise, and unwavering support. Her valuable insights and constructive feedback have been instrumental in shaping this research study.

I would also like to extend my appreciation to the participants who generously contributed their time and insights to the survey and interviews. Their willingness to share their experiences and opinions has been invaluable in enriching the findings of this study.

I am thankful to my family and friends for their constant encouragement, understanding, and belief in my abilities. Their unwavering support has been a source of strength throughout this research endeavor.

I am indebted to the faculty members and staff of Yeditepe University for providing a conductive academic environment and resources necessary for the completion of this thesis. Their dedication to education and research has been inspiring.

Lastly, I would like to acknowledge the contributions of all the researchers and scholars whose work I have referenced in this thesis. Their groundbreaking research and insights have laid the foundation for my study and have shaped my understanding of the subject matter.

Although it is not possible to mention everyone by name, I am sincerely grateful to all those who have played a part, no matter how small, in the successful completion of this thesis.

Thank you all for your support, encouragement, and contributions.

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1. Introduction

The world has recently witnessed the emergence of a new situation - the health emergency - which has resulted in the destruction of some industries while others have seized the opportunity to generate booming revenues and growth. The video gaming sector is one of the strongest and fastest-growing industries, with the global gaming sector worth increasing from $120.4 billion in 2017 to $235.7 billion in 2022 (PwC; 2022).

The usage average of this industry is increasing rapidly, with the United States having the highest number of video game users. Approximately, in 2022, 74% of households in the US have at least one member who plays video games, with 76% of individuals under the age of 18 and 67% of adults playing video games, according to video game data. Even 7% of individuals over the age of 65 are playing video games. Similar averages can be found in Europe, Asia, and even Africa, due to globalization. For instance, in 2022, approximately 50% of German people are video gamers, about one in three people in China play video games, and 186 million gamers have been found in Sub-Saharan Africa (PwC; 2022).

In the midst of this growth, a philosophical view influenced by Johan Huizinga's fundamental ideas sheds light on the significance of play in human culture. In his seminal work, he explores the concept of play as a foundational aspect of human culture. He contends that play is not merely an activity but a defining trait of human behavior that shapes societies, language, art, and rituals. According to Huizinga, games provide a structured and voluntary way for humans to experience and engage with the world, fostering creativity, imagination, and social cohesion. He sees games as a vital mode of human expression that bridges the gap between ordinary life and the realm of the extraordinary (Huizinga, 1938).

This sector is predicted to continue growing, with an expected value of $321 billion by 2026, particularly with the advent of the so-called Virtual Reality. Virtual Reality (VR) is a 3D visual environment simulation created by using computer modeling and technologies, enabling a person to interact with a virtual world where objects have a

spatial presence. Although virtual reality was initially used in science fiction and movies since the 20th century, it was considered something illogical and merely a dream. However, the prospect of scrutinizing virtual reality (VR) applications substantiated the paradigm shift from mere aspiration to tangible actualization (PwC; 2022).

As this industry continues its upward trajectory, philosophical inquiries inspired by Bernard Suits' "The Grasshopper: Games, Life, and Utopia" (1978) beckon to explore the motives underlying the pursuit of play. Suits introduces the concept of the "lusory attitude", highlighting the voluntary embrace of constraints within the realm of games. This perspective resonates profoundly in the context of virtual worlds, where individuals willingly engage with artificial rules and systems to experience a unique form of reality. The intersection of Suits' contemplations with the world of gaming prompts contemplation about the ways in which gaming offers a space for individuals to navigate self-imposed challenges, revealing insights into human motivations and aspirations (Suits, 1978).

In recent years, the video gaming industry has experienced profound technological advancements. These innovations have introduced new gaming environments that supplant conventional 2D settings with immersive 3D spaces that simulate real-life environments and make the game more realistic. To access this world, users must wear VR goggles, which surround them with visuals and sounds that make the experience feel real.

In 2019, the global VR gaming market size was estimated to be worth over $13.4 billion, and it is expected to exceed $90 billion by 2026, particularly due to the pandemic situation worldwide (ZMR; 2023).

The potential of the VR technology market is expected to boom, particularly in Europe and North America, with an average growth rate of 35% annually in the coming years.

Given these projections, Video game companies are increasingly using this new technology to create updated versions of games, in line with the goals set for 2026. This is particularly important, given the expected global user interest. To confirm these expectations, this research examines the preferences and opinions of users and players worldwide, using the following methodology (ZMR, 2023).

Deeply integrated into these virtual worlds is the realm of ethics. In his book "The Ethics of Computer Games" (2009), Miguel Sicart suggests that games have their own moral rules, and the decisions made within these worlds prompt significant questions about how virtual and real-world ethics align. Considering Sicart's viewpoint within the gaming context invites to think about how the decisions made in virtual settings have effects beyond just the screen, touching on themes like our ability to act, our duties, and how games reflect society (Sicart, 2009).

VR gaming is one of the biggest trends in the gaming industry, with some players preferring it over traditional video gaming while others still prefer the simple way of playing their favorite games. The research of this thesis aims to study the preferences of players who have tried both techniques and the reasons behind their choices. Additionally, the study seeks to investigate both the shared traits and distinctions between the two techniques of playing: virtual reality video gaming and traditional video gaming.

Therefore, the methodology chosen for this research is quantitative research that utilized surveys to gather data on the preferences and experiences of players who have tried both VR gaming and traditional video gaming. The collected data is analyzed using statistical analysis techniques to compare and contrast the preferences and experiences of players. Furthermore, qualitative research methods, exemplified by online and face to face interviews, have been integrated to delve more profoundly into the underlying factors behind players' preferences and experiences. The study aims to use a random sample of participants to ensure that the data collected is representative of the broader population of players.

In the context of this study, "traditional video games" refer to the established genre of electronic games experienced on platforms like computers, consoles, and handheld devices. These games span diverse genres, presented in two-dimensional (2D) or three-dimensional (3D) graphics on a screen. Interaction is facilitated through standard devices like controllers and keyboards. Unlike the immersive nature of virtual reality (VR) games, traditional video games engage players primarily through visual and auditory stimuli, offering a familiarity that distinguishes them from the evolving landscape of VR gaming.

2. Game

2.1 Definition of game:

A game is an organized form of play that is often enjoyed for entertainment and joy, but it can also serve as a medium for education. Many games are also considered to be a form of labor or art, such as professional sports or competitive games. Some people play games just for fun, while others play to achieve a goal or win a prize. Games can be played by professionals or non-professionals, individually, in groups, or remotely. Non-players can also be present as an audience, such as when spectators enjoy watching a competition. Conversely, as they wait for their turn to play, game players can act as their own audience. Determining who is in the audience and who is a player in a game can be a fun activity for kids. A game is not the same as a toy. In contrast to games, which have pre-established rules, toys often allow for uncontrolled play.

Games often combine both mental and physical development. Several games contribute to enhancing practical abilities, functioning as forms of exercise, or fulfilling educational, psychological, and simulation objectives (Merriam Webster; 2017).

In his famous book Homo Ludens (1938), J. Huizinga defined play as an activity that occurs within specific time and space constraints, following freely chosen rules and a visible order. It exists outside the realm of necessity or practical value and is characterized by a feeling of joy and excitement. Depending on the occasion, play may be considered holy or celebratory. The activity is accompanied by a sense of exaltation and tension, and is typically followed by feelings of fun and relaxation. (Huizinga J., 1938)

The word “Game’’ has been defined in a different way from various dictionaries such as:

Merriam-Webster: "a contest that involves either physical or mental exertion and is governed by a set of regulations, wherein the players are pitted against each other in a direct manner."

Oxford English Dictionary: "a recreational pursuit or entertainment that involves participating in an activity, such as a sport or pastime, typically following established regulations. It often includes competitive teams or individuals striving for victory."

Cambridge Dictionary: "a form of amusement or competition, typically enjoyed by kids, and may also include the equipment necessary to play it."

Collins English Dictionary: "a pastime or athletic endeavor that typically requires proficiency, expertise, or luck, and involves adhering to established regulations while striving to defeat an adversary or solve a challenge."

In his book "Game Theory", Colombian mathematician Professor Guillermo Owen explains that games, as they are commonly understood from playing board or card games, are based on a fundamental concept. The game starts from a fixed position, and players take turns making moves from a set of available options. These moves may be influenced by chance events, such as rolling a die or shuffling cards. Examples of such games include roulette, which is entirely based on chance, bridge, where chance plays a significant role, and chess, which does not involve any chance events except for determining who moves first (Guillermo O.; 2013; P:1).

Particularly, videogames, usually referred to as computer games, are electronic games that require interaction with a user interface or input device to create visual feedback, such as a joystick, controller, keyboard, or motion sensing device. The most frequent place for this feedback to be displayed is on a video display device, like a TV, monitor, touchscreen, or virtual reality headset.

Video games typically provide not only visual but also auditory feedback, delivered through speakers or headphones, and sometimes other forms of feedback such as haptic technologies. Depending on the platform they are played on, video games can be classified as personal computer (PC) games, which offer a wider range of user-determined gaming hardware and software and typically have higher input, processing, visual, and audio output capabilities; console games, which are played on a video game console connected to a TV or other audio-visual device; or arcade video games, which use electronic or computerized equipment to process player input and display the game on a screen.

The gaming industry has expanded to include mobile gaming through smartphones, tablet computers, and online cloud gaming. Video games are categorized into various genres based on their gameplay type and objectives (Stefan B. H., 2020).

2.2 Game theory:

2.2.1 Definition:

The purpose of game theory is to deepen our understanding of decision-making interactions between individuals or groups. While games, as commonly understood, involve competition among players following a set of rules, game theory has wider applications. It can be used in various contexts, such as businesses competing for customers, politicians seeking votes, jurors deliberating on a verdict, animals gathering prey, auction bidders competing for prizes, and legislators voting on issues under the influence of special interests.

Game theory, like other sciences, relies on a range of models to aid in understanding of observations and experiences. Models are abstractions used to make sense of complex phenomena, but the concept of "understanding" is not always clear. At a minimum, understanding involves perceiving connections between events and identifying general principles that apply to a variety of scenarios, enable to apply new information to the person’s thinking.

For example, it might using a model that assumes a tennis ball moves at a constant speed while being pulled towards the ground by a constant force known as gravity, to match observations of the ball's trajectory. This model enhances the understanding by applying to the paths taken by other thrown objects, such as baseballs or cricket balls, regardless of how hard or in which direction they are thrown.

However, if a model's assumptions conflict entirely with observations, it is unlikely to advance the understanding of the phenomenon. The strength of a model lies in its clarity; the assumptions on which it is built should reflect the essence of the situation, rather than irrelevant specifics. For instance, when analyzing the trajectory of a thrown ball, it must not consider the distance of the tennis ball from the earth's surface (Martin J. O.; 2000).

In game theory, the basic unit is a player, which can either be an individual or a team working together to make decisions. Models in game theory can be divided into two types, based on whether the sets of potential actions are individual player actions or joint

actions of a group of players. Once the set of players is determined, the two types of models can be differentiated. The first type, where potential individual player actions are the primary focus, is sometimes called "noncooperative". The second type, where potential joint actions of a group of players are the focus, is sometimes called "cooperative".

Philip D. Straffin, a mathematician, claimed that game theory provides a logical explanation for both cooperative and competitive situations. Specifically, a game is defined as any situation in which:

- There are two or more players, which can be individuals or larger entities such as companies, countries, or even biological species.
- Each participant has a variety of options for strategies and courses of action that they can choose from.
- The strategy chosen by each player affects the outcome of the game.
- A group of numerical payoffs, one for each participant, is associated with each potential game result. These payoffs represent the value of the outcome to the different participants (Philip D. S.; 1993; P:13).

2.2.2 Game strategies:

The term "strategy" encompasses perspectives, positions, plans, and patterns. It refers to the link between tactics or practical activities and high-order aims or policies. Together, strategy and tactics bridge the gap between goals and means.

Basically, strategy is a complex network of ideas, insights, objectives, experiences, memories, perceptions, and expectations that provides a broad direction for individual actions taken in pursuit of particular purposes. It represents both the route chosen and the journey imagined making. Even while embarking on a journey of discovery without a specific destination in mind, it still has a goal, an expected outcome, and a conclusion that should be kept in mind.

Therefore, without clear goals, strategy is meaningless. It is a broad framework that provides direction for activity while also taking the form of action. In other words, having

a clear understanding of the desired goals is a fundamental requirement for developing a plan. Action without these goals in mind is purely tactical and can easily reduce to nothing more than flailing (Fred N.; 2016).

The establishment of an organization's fundamental long-term goals and objectives, the adoption of action plans, and the allocation of resources required to carry out these objectives are all examples of strategy.

It is possible to trace the origins of strategy as a military idea. General Ulysses Grant defined strategy in the 1860s as 'the deployment of one's resources in a manner which is most likely to defeat the opponent'.

Structured strategies have been used in businesses since the early 1970s. The official history of strategy in the business industry began with Richard D. Irwin's theory in 1971, which described strategy as a match between a company's capabilities and existing environmental conditions (Katz B.R., Preez N.D., Schutte C.S.L.; 2010; P:63-64).

On the other hand, games provide a confined environment and a defined set of rules that are perfect for discovering the capabilities of artificial intelligence (AI). This enables the creation and evaluation of problem-solving strategies before they are used to solve more complex real-world problems (Schaeffer J.; 2001; P:2).

The intuitive meaning of strategy is that of a game plan, where players tell themselves, 'If this happens, I will do this.' This type of thinking involves anticipating different scenarios and planning ahead for how to respond to them.

In general, it is assumed that a player will only choose their move in a game a few moves beforehand at most, usually only when they must make it. This must be the case, as there are too many possible moves in games like chess or poker for anyone to plan for every scenario well in advance. From a strictly theoretical perspective, this practical limitation might be ignored, and it could be assumed that each player has already chosen what they would do in each situation before the game begins. Therefore, it can be supposed that each player decides on a strategy before the start of the game.

Choosing which of the strategies is better from the viewpoint of maximizing the player's share of the payoff is what the players are interested in. However, as no one can predict the results of chance moves other than probabilistically, it is only logical to take the

mathematical expectations of the payoff function when the players are following a certain strategy. Most games are finite games, meaning that their tree only has a finite number of vertices, which provides the players with only a finite number of strategies (Guillermo O.; 2013; P:4).

The main principle of game theory, as applied to rule-based games, is that 'to every action there is a reaction'. To analyze the reaction of the other side after making a move, the selected strategy must take into account all possible reactions, including personal reactions, to the other side's actions as far ahead as possible.

To decide what kind of actions will lead to the planned outcome, one must first look far ahead in the game and then work backward to determine the necessary steps. To play a game effectively, each player requires a strategy, which serves as a roadmap for action, guiding the player on how to decide at each decision node. More specifically, a strategy defines what to do at each information set, as a player cannot tell which nodes are present in any given information set (Adam M. B. & Barry J. N. ;1995; P:6).

2.3 History of game:

2.3.1 History as a Science:

The fundamental need of history as a science is to synthesize enormous amounts of data in order to describe the development of human societies. Its inherent flaw is the exclusion of certain sources and artifacts. The positivistic methodology's self-declared objective of collecting facts that are mathematically arranged and chronologically ordered cannot hide the undisputed fact that the choice of pertinent data is always influenced by the worldview of modern historians.

Games have existed since the primitive ages of humankind. All cultures include games in their daily activities, as they are among the earliest forms of human social contact. The current state of a particular culture, its obsessions, and its ideals frequently serve as an implicit telos that already influences the gaze and preselects pertinent material in order to put together a teleological causal chain. These forms of exclusion only serve to reflect the selection made by any given period under study, greatly complicating the work of historians, whether it is to serve the glorification of a national identity or to foster a

consoling illusion of control over the informational chaos that surrounds us. A more narrowly focused area such as art history cannot escape what is true for historical science as a whole (Mark J. P. Wolf; 2012; P:9-11).

2.3.2 Games in education and social interaction:

Games are formal expressions of play that allow people to use their imaginations in ways beyond simple direct activity. Games often involve unpredictability in the outcomes, established rules, competition, specific locations and times, elements of fiction, elements of chance, predetermined objectives, and fun.

Games preserve and transmit the concepts and worldviews of their cultures to the next generation. Games have served as essential mediums of education, social status indicators, and occasions for fostering cultural and social ties. Some games that were formerly only played by royalty and the wealthy became common attributes of court culture and were also offered as presents. The Mesoamerican ball game, a ritualized sport played by the pre-Columbian inhabitants of ancient Mesoamerica since 1650 BC, and other games like Senet, an old Egyptian board game, were often infused with mythology and traditional religious significance. The political and military elite saw Shatranj and Wéiq (Go) as tools to cultivate strategic thinking and mental competence, while games like Gyan Chaupar, a dice game that was adapted from the ancient Indian game Chaupar (often known as Snakes and Ladders), and The Mansion of Happiness, a children's board game based on Christian ethics, where players compete in races around a 66-space spiral circuit that features virtues and vices, with the Mansion of Happiness serving as the finish line, were used to impart spiritual and ethical precepts.

Figure 1 : The Mesoamerican ball game (1650 BC)

(Mark Cartwright ;2013)

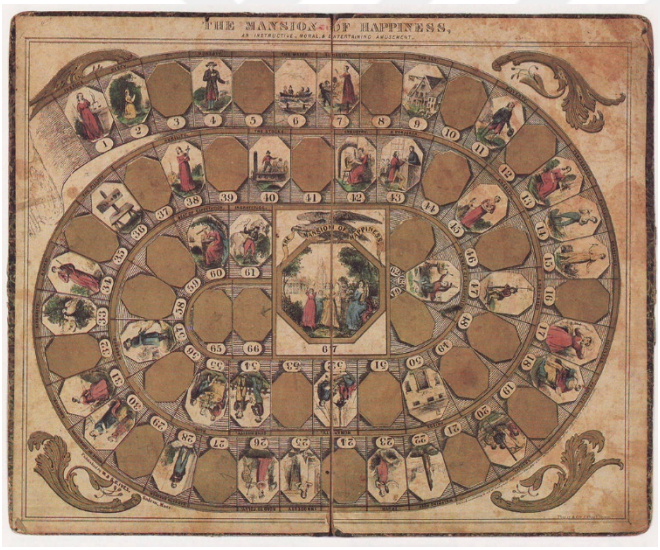


Figure 3 The Mansion of Happiness (1843)

(William and Stephen B. I.; 1843)

Figure 2 : Jain Gyan (India, 19th century)

(Wikimedia Commons ; 2014)

The predecessors of knucklebones and dice games, particularly those constructed from the talus bone, were among the most popular prehistoric and ancient gaming implements. These tools have been discovered across the world. Dice were probably not invented with six sides until at least 5000 years ago. Additionally, these bones were occasionally employed for oracular and divinatory purposes. Shells, stones, and sticks may have been used as additional tools.

Durkheim claimed that games were fundamental to social bonding and that their origins were in religious settings (Kaloumba; 2021).

Durkheim's perspective on games as facilitators of social cohesion and their roots in religious practices provides a thought-provoking viewpoint. Across centuries, games have been integral to human culture, fostering connections and shared experiences. By exploring their historical and cultural contexts, we unveil their societal importance. Durkheim's lens demonstrates that games are not just leisure activities but instruments that bind individuals together.

Furthermore, Durkheim's recognition of the spiritual origins of games sheds light on their deep cultural significance. Although modern games may seem distinct from religious rituals, they carry echoes of shared experiences that transcend time. This connection accentuates how games are more than diversions; they encapsulate our collective desire for unity. Durkheim's insights reveal the intricate interplay of games, culture, and social bonding, underscoring their role in uniting individuals across generations and traditions (Durkheim, 1912).

2.3.3 Games in the Bronze Age:

The first evidence of a game created by humans dates back to the Bronze Age (Chalcolithic age) around 7000 years ago and was discovered in Europe. Nevertheless, "The Royal Game of Ur," discovered near the Persian Gulf, is considered the world's oldest game. The Assyrians created it more than 5000 years ago, and it is a board game where players move pieces around a course represented on the board. This game is currently kept at a museum in London. Puzzle games have also been documented by archaeologists in paintings and murals from Babylonian and Egyptian cultures. While many games were created during ancient Greece, there is no evidence of games involving currency. Roman games emerged, and it is possible that they were similar to Greek games (Kaloumba; 2021).

Alfonso X the Wise, the king of Castile and Leon, made a notable contribution to the world of games in 1280 when he documented several games such as chess and alquerque in his book "The Book of Games." Additionally, the game of checkers or goose witnessed a significant expansion around 1850, coinciding with the zenith of the industrial

revolution. These historical moments underline the enduring popularity of strategic and recreational pastimes.

Transitioning to the contemporary era, the Western game industry witnessed a substantial resurgence in the 1980s. This resurgence laid the foundation for the digital gaming landscape that prevails today. The evolution of games has transitioned from traditional physical board games to the virtual realm of video games. The 20th century's surge in technological advancements, particularly in computing and digital technology, enabled the creation of immersive and interactive virtual game worlds. As a result, the scope of gaming has expanded exponentially, encompassing various genres, platforms, and global communities.

The trajectory of gaming from historical board games to modern digital landscapes underscores the universal human inclination for playful engagement and strategic recreation. The widespread popularity of checkers and the plethora of game varieties played worldwide highlight the remarkable evolution of this age-old pastime into a diverse and dynamic family of games (Kaloumba; 2021).

2.3.4 The advent of video games:

The institutions responsible for the conservation of video games, equivalent to those for film preservation, are still in their early stages despite recent growth in video game studies. For many years, the Videotopia show was the closest thing to such an institution. The Electronics Conservancy group set out to identify and restore 400 unique arcade cabinets while also assembling a collection of home video game consoles after realizing "the destruction of most of these games and worrying about their loss of historical significance." The establishment of the Berlin Computerspiele Museum took place in 1997. A significant stride occurred in January 2011 with the inauguration of its latest permanent exhibition titled "Computer Games: Evolution of a Medium." This exhibition, featuring an extensive assemblage of over 300 items, underscores the museum's commitment to tracing the evolutionary trajectory of computer games.

In 2007, the Library of Congress announced a pioneering initiative – the creation of a "game canon." This compilation is composed of the 10 most pivotal games, a result of

collaborative efforts from eminent institutions under the guidance of Henry Lowood, a distinguished games researcher affiliated with Stanford University. While endeavors associated with academic-related collections and programs are in progress, certain challenges in terms of financial support and preservation capacity are evident.

Within the framework of the "History of Science and Technology collections" curated by Lowood, Stanford Libraries have amassed a substantial repository of video game artifacts by the late 1990s. This encompassing collection spans thousands of games across various platforms, ranging from the Atari 2600 to the Microsoft Xbox. The convergence of these efforts underscores the recognition of video games as a cultural and scholarly pursuit, paving the way for their comprehensive documentation and academic exploration.

The National Video Game Archive has announced an ambitious conservation project aimed at avoiding the mistakes made in the film industry that led to the loss of historically important components in the past. English scholars from Nottingham Trent University and the National Media Museum in Bradford are working on the project. However, the most complete virtual recreations of conservation institutions exist in the world of video games. It is important to note that the following observations are not meant to be a critique of the enormous value provided by online databases and emulation efforts; rather, they are intended to point out the unavoidable faults present in such projects. A surprising number of general-purpose video game databases are already accessible online, only ten years following the widespread expansion of the Internet. Every significant online gaming publication eventually includes games that existed before it. However, publications prioritize producing editorial material for new releases, while corporate databases only replicate the most basic details (such as release date, platform, and genre) about older titles (Mark J. P. Wolf; 2012; P:9-11).

2.4 Types of game:

The game types are divided in four basic types: Invasion/territory, Net/wall, Striking/fielding, and Target (Paul I. W., Philip J. P., G. Forrest.; 2006).

2.4.1 Invasion/territory:

Called also team games, it has the objective of invading the area of the opposition in order to score a goal or point, all within a defined time period. These are frequently fast-paced games that need cooperation from the entire team in order to keep control of the ball, maintain possession, advance to a scoring position, and stop the opposition from scoring. While attempting to score and keep the opposing side from scoring, teams share the same playing area. This type of game includes floorball, rugby, handball, basketball, hockey, lacrosse, etc…

2.4.2 Net/wall:

In net/wall games, players launch an item towards a court or other target area that their rivals are protecting. The objective is to direct the item to land in the target zone while making it hard for the adversary to return it. Participants will gain technical skills of the essential techniques and strategies for games such Sepak Takraw, Wheelchair Tennis, Tennis, Badminton, Squash, and Sitting Volleyball by participating in these activities.

2.4.3 Striking/fielding:

Striking and fielding games allow one side to score points when a player hits a ball (or other similar item) and sprints to specific playing zones, while the other team tries to catch the ball and return it to stop their opponents from scoring. The most well-known ones of this type of games are baseball, cricket and softball.

2.4.4 Target:

Target games entail launching an item at a target while avoiding any obstacles in order to score as highly as possible. Target games objectives are used in sport including golf, ten pin bowling, croquet, and archery.

Particularly, videogames had its own types where there is a distinct difference between them, the most famous types are (Rollings, Andrew, Adams, Ernest; 2003):

- **Action games**: are the games that focus on action intensity as their main attraction. The main skill required to play these games successfully is reflex response. The most popular action games are stealth and shooting. The majority of sports games fall under the category of action games, while other sports games are simulations.

- **Adventure games**: are the games with the main attraction is exploration and puzzle-solving. While their popularity has decreased over the past 20 years, these games used to have the most compelling stories. The three qualities that make a good adventure game player are logic, imagination, and curiosity. Early adventure games include Syberia and Myst.

- **Puzzle games**: are the main attraction of games. Most frequently, these games are made available online for low price. The oldest segment of the gaming community tends to be those that play these games. The most popular puzzle games are Tetris, Lemmings, and Minesweeper. Another interesting puzzle game that had less popularity was I.Q. Intelligent Cube.

- **Role playing games**: are the games that allow the player to fully experience the conditions of the player character. By embracing innovative methods to modify and report stories, role-playing games (RPG) maintain their historic legacy in storytelling. RPG have long game sessions, richly detailed characters, and extensive character management systems. Baldour's Gate, Fable, Might and Magic, Neverwinter Nights, Ultima, and World of Warcraft are a few the famous RPGs.

- **Simulation games**: An important aspect of a simulation's gameplay is how well it can mimic actual circumstances. Simulated activities aim to entertain by acting out scenarios. In this genre of game, racing and combat simulations are quite

common. Other types of simulations include social scenario like Sims and Leisure Suit Larry1. Also, The Tycoon games and Gran Tourismo are the popular ones.

- **Strategy games**: games that provide amusement through logic and problem-solving. Early strategy games (like Civilisation) did not make extensive use of narration, while more modern games rely strongly on storytelling. Command and Conquer, for instance are one of the strategy games which rely on storytelling.

3. Virtual reality

3.1 Definition of virtual reality

Virtual reality conjures up an image of a reality without requiring physical interaction or other physical components required to produce that reality. According to the standard dictionary definition, the word "virtual" refers to something that is in effect but not in actual name or form. Even though virtual things are not real, there is a natural urge to reach out and touch them. This is where virtual reality (VR) offers something innovative: it lets the user reach out and manipulate items as if they were real.

The NASA Ames Research Center defines virtual reality as the use of computer technology to simulate a three-dimensional, interactive environment that creates a feeling of spatial presence. Stephen Bryson, a researcher at NASA, suggests that VR can be defined by its cognitive effects: generating a sense of spatial presence, immersion, and engagement with objects. Bryson distinguished between virtual reality and telepresence, in which items are presented to our senses remotely. He examined the definition piece by piece:

- "Computer technology" is necessary to differentiate VR from telepresence and other forms of remote sensing. A large part of the public interest in VR stems from the ability to use computer programs to construct intriguing and innovative custom-made worlds.
- "Engaging" to differentiate virtual reality from traditional animation. The ability to engage with the virtual environment is a major factor in the public's enthusiasm for VR.
- "Three-dimensional world" is used to exclude 1D and 2D applications and text-based settings, which encompass essentially all of interactive computer graphics.
- "Objects have a sense of spatial presence" refers to the idea that items appear to have a physical location that is distinct from the user and the display technology. This is what makes VR unique.

- "Immersion" is defined as "being surrounded." To feel immersed, the user must feel as though the world is all around them. If something is behind them, they should be able to see it when they turn around.

A questionnaire designed by psychologists James G. Witmer and Michael J. Singer, who developed the concept of presence in virtual environments, in 1998 has received over 3,500 citations in the literature. The researchers found that the participant's ability to transfer attention from their actual surroundings into the virtual reality environment, including the ability to dismiss or ignore irrelevant inputs from their physical environment, is necessary for presence. In virtual reality, "presence" refers to engaging with a computer-generated environment rather than a real-world setting. The writers also defined immersion as the psychological response to virtual reality (VR) that leads the person to become immersed in and engage with a continuous stream of virtual and haptic inputs and experiences.

The media has described virtual reality as a medium similar to the telephone or television. This new medium is often characterized by a specific group of technology devices such as computers, head-mounted displays, headphones, and motion-sensing gloves. The emphasis on virtual reality is therefore technological rather than experiential, with its locus being a group of devices. For the manufacturers of these technologies, this idea can be beneficial as it provides a key marketing tool. In fact, Jaron Lanier, the CEO of VPL Research, Inc., a manufacturer of gloves, goggles, and other VR equipment, first coined the term "virtual reality" (VR) in 1989. (Frank B.; 1992; P:23).

A device-driven definition of virtual reality, however, is unsatisfactory in the eyes of communication scholars, policymakers, software developers, and media consumers. It fails to offer insight into the workings or results of using these systems, a conceptual framework for regulatory policy, an aesthetic for media production, or a way for users to draw on their prior knowledge of other forms of media to understand the nature of virtual reality.

Grigore C. Burdea, a professor at Rutgers the State University of New Jersey, has created the virtual reality triangle to define the elements of virtual reality, which he calls the "three I's" (Burdea, G. C., & Coiffet, P.; 2003).

- **I**mmersion: refers to the perception of having a physical presence in a non-physical environment. The user of the VR system is surrounded by sights, sounds, or other stimuli that form an immersive overall environment to produce this perception.
- **I**nteraction: refers to the natural engagement between the user and the virtual environment. Through interaction, users feel a sense of being in the actual environment.
- **I**magination: the VR environment could be compared with the imagination in terms of what it provides to the eye to trick the brain into thinking that the physical presence is real.

3.2 History of virtual reality

The term "virtual reality" was first used in the mid-1980s when Jaron Lanier, creator of VPL Research, began developing the goggles and gloves needed to experience what he called "virtual reality." However, technologists had already been creating virtual environments prior to this. Sir Charles Wheatstone, whose research led to the development of the stereoscope, was the first to define stereopsis in 1838 and was awarded the Royal Medal of the Royal Society in 1840 for his theory of binocular vision. The study demonstrated that the brain combines two images of the same object taken from different angles with each eye seeing one image to create the perception of depth and immersion in 3D. Wheatstone was able to create the first stereoscope using this technique, which employed two mirrors placed at 45-degree angles to the user's eyes, with each reflecting an image that was offset to the side (Dom B.; 2022).

In 1956, the Sensorama was one of the most significant events. Previously, Morton Heilig, an American pioneer in virtual reality technology and a filmmaker, worked in the Hollywood film industry. He was interested in how viewers could experience being "in"

the movie. In the Sensorama experience, you could "ride" a motorcycle across a model of a typical city environment. Multisensory stimulation in the created "world" allowed you to see the road, hear the engine, feel the vibration, and smell the motor's exhaust.

n 1960, Heilig also obtained a patent for the Tele-sphere Mask, a head-mounted display device. Several inventors built upon his major work (SIGGRAPH; 1992).

Ivan Sutherland, another inventor, proposed "The Ultimate Display" in 1965, which was a head-mounted device that functioned as a "window into a virtual space." The same inventor also created the first hardware-based virtual reality system, called "The Sword of Damocles," which was more than just an idea. Ivan Sutherland built what is considered to be the first Head Mounted Display (HMD), complete with accurate head tracking. It provided stereo vision that updated properly in response to the user's head movement and orientation.

Later, in 1975, Myron Krueger, an American computer artist, developed VIDEOPLACE, an artificial reality that he described as "a conceptual world, with no actuality." In this system, users' silhouettes were captured by cameras and shown on a big screen. Image processing methods that established the participants' locations in the 2D screen's space allowed them to communicate with one another.

After that, Thomas Furness, an American professor and inventor, created the Visually Coupled Airborne Systems Simulator (VCASS) at the US Air Force's Armstrong Medical Research Laboratories in 1982. VCASS was a sophisticated flight simulator. The fighter pilot wore an HMD that added graphics stimulating targeting or the best flying paths to the view outside the glass.

In 1992, the CAVE (CAVE Automatic Virtual Environment) was released. It is a system for visualizing science in virtual reality. It displays stereoscopic graphics on the walls of a room instead of requiring a head-mounted display (users must wear LCD shutter glasses). Compared to HMD-based systems, this method ensures that the graphics being viewed are of higher quality and resolution and have a larger field of vision.

Next came augmented reality (AR). This term refers to a form of technology that presents a virtual environment that enhances, rather than replaces, the actual world. This is achieved through a see-through head-mounted display (HMD), which superimposes

virtual three-dimensional objects over real ones. Previously, this technology was employed to bring more flying data to the fighter pilot's vision (VCASS). In the early 1990s, many research teams turned their attention to augmented reality because of its huge potential to improve human perception (SIGGRAPH; 1992).

3.3 VR in gaming field

Since the rise of user-focused technology, every aspect of our lives seems to be changing rapidly and constantly. Impressive as it may seem, VR has sparked a revolution in gaming that was once thought to be impossible. In recent years, the gaming market has grown rapidly, with smartphone users being the biggest contributors to the gaming industry's development, spending tens of hours on their phones or other new gaming technologies. It is generally assumed that smartphones and the latest technology have completely transformed the gaming experience.

The game industry's use of virtual reality has been growing over the past few years. The advent of Samsung's VR gear and Oculus VR marked the commencement of a new era in VR gaming. HTC also released the Vive in 2015, with improved controls. Since then, over 230 VR development companies have emerged, creating various VR software and hardware. A handful of the major players include Samsung, Google, Microsoft, Unity, and Oculus VR. Revenue from the VR gaming industry surpassed $15 billion in 2019, up from about $3.5 billion in 2016. These figures demonstrate the rapid market growth of the VR gaming industry. Consequently, the burgeoning significance of virtual reality (VR) within the gaming industry is becoming increasingly evident, notably accentuated by the onset of the pandemic, compelling individuals to remain indoors and observe isolation measures (Saynee P., Koushik P., Suniket P., Snehasish B.; 2022; P:798).

Due to the COVID-19 pandemic in 2020, many individuals found comfort and entertainment by engaging in video gaming during extended periods of home lockdowns. In June 2020, people spent more time playing video games due to the COVID-19 pandemic. In all regions, the time spent gaming increased by double digits. Latin American gamers increased their gaming time by 52%, and Asia-Pacific saw a 42% increase. Games where many players can join, like fighting and battle royale games, were really popular. A survey in Europe found that playing video games during lockdowns

made players feel less alone and happier. Online multiplayer gamers felt good about their gaming experiences during lockdowns (J. Clement, Statista, 2022).

The predicting of the hardware and gaming markets for virtual reality in the foreseeable future, estimates suggest that income from VR gaming may reach $3.2 billion by 2024, with up to 46 million active headsets among other factors. As of 2022, the VR market has grown to $1.8 billion with 27.7 million headsets in use. The study indicates that standalone headsets, cloud streaming, and support for VR by well-known game engines are all contributing to greater accessibility of games. (Newzoo; 2022).

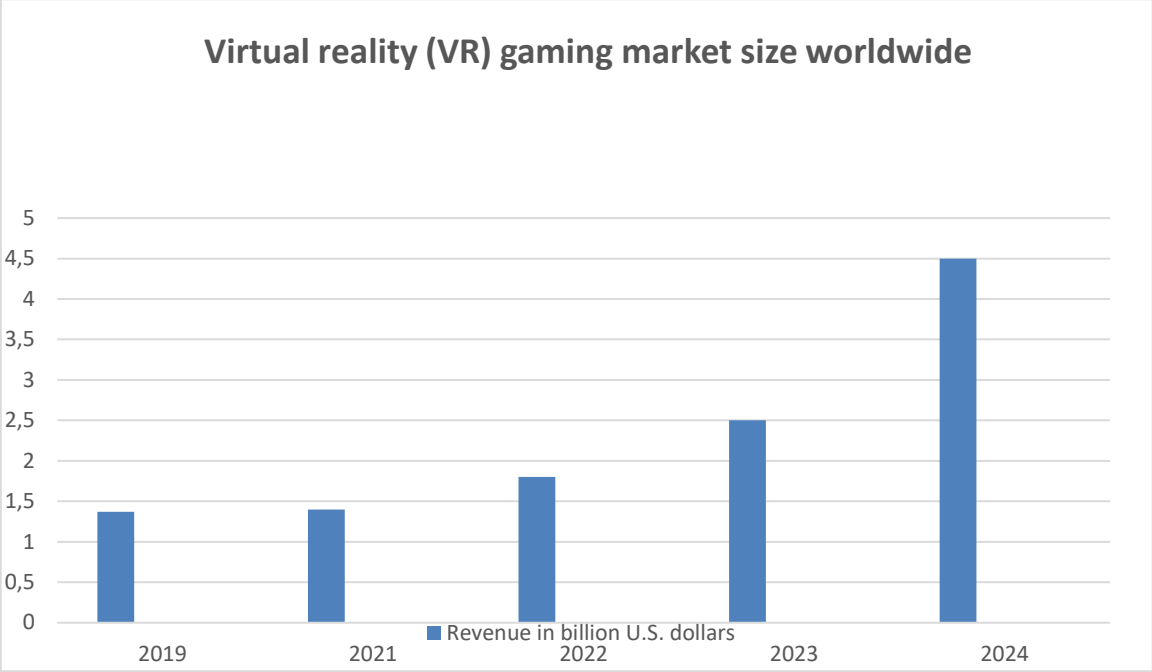


Figure 4 : Virtual reality (VR) gaming market size worldwide
(Newzoo; 2022)

As can be seen in this recent figure, the virtual reality gaming market experienced a significant increase following the pandemic. The majority of people were forced to try this experience while staying at home, and many have since become addicted to it or find most of their enjoyment in it. These circumstances, among other influences, have collectively fueled a remarkable shift in perception, propelling virtual reality gaming from a niche interest to a global phenomenon.

Manufacturers have made an unbelievable innovation to to ensure players are immersed in a seamless and captivating experience, complemented by appropriate equipment. Virtual reality (VR) has profoundly reshaped the landscape of the video game industry through its innovative actions: (Wharf Street Strategies; 2018).

- **Renewed interest in 3D:** The idea of 3D movies is not new to the world, but due to its high cost, it has not been attractive to viewers. However, in select areas such as the movie "Avatar," 3D has become increasingly popular. The spotlight is shifting towards the gaming sector, where 3D effects provide players with an engaging experience and serve as the game's core principles.
- **Captive experience:** As times have changed, the gaming industry has become more popular, increasing players' demand for it. This experience makes it difficult for players to differentiate between the real world and the virtual world, which is essential for the success of any game in the modern era. To create a great gaming environment, developers have created a perfect environment where players can also take on the role of their avatar.
- **A change in lifestyle:** The development of VR has transformed it from just entertainment to various other industries including healthcare, tourism, education, and entertainment, in order to enhance the user experience. This is a popular strategy that is progressively catching the consumer's eye.
- **Creative content:** VR stands out not only for its superior experience but also for its adaptable and captivating material, which is expertly developed by game developers. Developers provide increased levels of personalized content to better fit the target market.

The prospects for Virtual Reality (VR) gaming have been opened up by recent advancements in motion sensors, graphics, multimodal display technologies, and interactivity, which enable seamless immersive experiences in highly interactive synthetic worlds. VR advances beyond associated technology to immerse the user in the story itself, experiencing it as in first person, ranging from exciting adventures to soothing, passive immersion. Because of the power of VR, serious games, like those used in education and training, become an exciting experience that helps players acquire new abilities and advance their competence. VR gaming is presently being used by businesses in the real estate, automotive, advertising, and tourism sectors to draw in new audiences or engage customers in new, engaging experiences. Additionally, VR gaming provides creative inspirations for media artists, musicians, filmmakers, and designers. (Siti S. M. N., Rimaniza Z. A., Nurhazarifah C. H., Meng C. L., Haslina A., Nazatul A. A. M.; 2018).

With the advent of VR gaming, the gaming environment has become more enriched with new components, improved virtual world experiences, and better methods to interact with the game environment. Interacting with virtual items through VR technology makes them more attractive. Games have become more interesting since the introduction of VR, due to the immersive experience it provides. Another significant advantage of using VR in games is that, unlike traditional game settings where players are forced to spend hours in front of the screen, VR games allow players to walk around and make gestures in addition to finger movements. Consequently, playing a VR-enabled game can actually help burn calories. Examples of such games include VR tennis, VR cricket, and several VR shooting games... (Saynee P., Koushik P., Suniket P., Snehasish B.; 2022; P:798).

By exploring the varying inclinations and motivations of gamers within these two distinct spheres, this research endeavors to provide insights into the multifaceted relationship between gameplay preferences and the distinctive features offered by VR technology. Navigating through the landscapes of VR-enabled interactive experiences and traditional gameplay, the investigation seeks to uncover the factors that contribute to the choices individuals make, ultimately contributing to a comprehensive understanding of the evolving gaming landscape.

4. Research

4.1 The scope of the research

Over the past few decades, the gaming has experienced a deep evolution, emerging as a profoundly impactful medium across cultural, social, and commercial realms since its initial emergence on television screens. With the development of new platforms and changing production and consumption trends, such as the Wii, Xbox 360, and mobile gaming, the industry has continued to grow and expand.

In recent years, the emergence of virtual reality (VR) has become a significant trend as systems attempt to create realistic views, sounds, and other sensations that simulate physical presence in a virtual space through the use of VR headsets or multi-projected environments. As a result, this research focuses on the latest update of the game field, which is the virtual reality video game. The surge in popularity of this innovative style of gameplay is notably driven by the younger demographic, recognized for their fervent engagement with video games. A substantial portion of players enthusiastically embraces this novel approach, displaying a willingness to depart from conventional methods. However, a contrasting perspective exists among some, who continue to exhibit a preference for the traditional, uncomplicated manner of engaging with their preferred games.

4.2 The aim of the research

The primary aim of this research is to investigate and compare the preferences and experiences of players who have tried both virtual reality gaming and traditional video gaming. Specifically, the study aims to:

Firstly, identify the factors that influence players' preferences between VR gaming and traditional video gaming. This will include exploring aspects such as graphics, immersion, interactivity, and game content.

Secondly, understand the reasons behind players' choices, including the perceived advantages and disadvantages of each technique, and how they perceive the future of VR gaming in relation to traditional video gaming.

Additionally, it’s interesting in finding out if players see VR gaming as a real option instead of traditional video gaming. This part will help in finding any challenges that might stop more people from trying VR gaming.

Lastly, comparing and contrasting the preferences and experiences of players between virtual reality gaming and traditional video gaming, in terms of gameplay and user experience.

By exploring these research purposes, this study seeks to contribute to the existing knowledge on VR gaming and its potential as a new technique of playing, as well as to inform future game developers, marketers, and other stakeholders in the gaming industry on the preferences and expectations of players regarding VR gaming and traditional video gaming.

4.3 The methodology of the research

The purpose of this research is to investigate and compare the preferences of virtual reality (VR) gamers and traditional video gamers. To achieve this, a quantitative research methodology is employed, utilizing surveys to gather data from participants who have experience with both VR gaming and traditional video gaming. The survey is designed to collect information on various aspects such as the types of games played, frequency of gameplay, gaming devices used, and preferences related to gaming experience (such as graphics, immersion, interactivity, etc.).

The research encompassed a diverse target audience of individuals from various age groups, genders, and educational backgrounds, totaling 300 participants worldwide. The participants were reached through a methodical approach utilizing social media groups and networks, ensuring a comprehensive representation. Employing a snowball sampling technique, the research aimed to capture a wide range of perspectives by leveraging existing connections within online communities.

The data collected have been analyzed using statistical techniques to identify and compare the preferences of players between the two distinct groups. This process entails employing the statistics to give a quick overview of the data and ascertain significant differences between the treatment groups. Through this analysis, insights into the similarities and distinctions in preferences and experiences between VR gamers and traditional video gamers are gathered. By comparing these treatment groups, the research attempts to make informed generalizations about larger populations, contributing to a more comprehensive understanding of the wider world of gaming.

In addition to the quantitative approach, qualitative research methods were also employed by conducting some interviews to delve deeper into the reasons behind players' preferences. To gather qualitative insights, a specific subgroup of participants was selected from the survey respondents who had agreed to take part in this type of research. These participants were reached through a targeted outreach method: a call for volunteers was shared across gaming communities in social media groups. This purposive sampling approach ensured that the selected interviewees possessed substantial experience and insights relevant to the study's objectives. The interviews, conducted with 4 volunteers

from different countries, thus offered a deep and focused exploration of the intricate dynamics at play within the realm of gaming preferences. Four individuals from different countries within the age range of 20 to 25 responded and provided short videos responding to questions about their gaming preferences.

These participants encompassed a range of educational backgrounds, including both university students and graduates. This sampling approach is categorized as purposive sampling, aiming to capture varied perspectives. The qualitative data collected from these participants were then meticulously analyzed using thematic analysis, revealing key themes and patterns that shed light on the intricate motivations driving players' preferences in the gaming realm.

To ensure that the data collected is representative of the broader population of players, a random sample of participants have been selected from gaming communities and forums. It's important to note that participation in the research is entirely optional. Additionally, all participants have been thoroughly briefed about the study's objectives, their rights as contributors, and the confidentiality of their input.

4.4 The limitations of the research

This research has selected several limitations that should be considered when interpreting the findings. Firstly, the study's sample size is not large enough to represent the broader population of gamers accurately. While every effort has been made to ensure the sample's diversity, the study's limited resources and time constraints have impacted the range of participants. This limitation affects the generalizability of the results, and caution should be taken when applying the findings to other populations or regions.

Secondly, the study is largely limited to certain geographical regions, primarily North America and Europe, with minimal representation from Africa and Asia. Players' preferences are notably influenced by cultural and environmental factors, with variations in technology accessibility and distinctions in gaming culture being prominent examples of these regional disparities. Also, the interviews conducted for this research exhibit a constraint in their scope due to the small sample size of only four volunteers. Despite

prolonged efforts to identify additional participants within gaming communities, an expanded pool of volunteers was not attainable.

Thirdly, the study is not account for individual differences, such as age, gender, and socioeconomic status, which influence gaming preferences.

Finally, this study primarily relies on participants' self-reported preferences and experiences, which may introduce a degree of subjectivity and recall bias. Participants might not accurately recall or express their true preferences, potentially impacting the validity and reliability of the gathered data.

4.5 Survey

4.5.1 Research design

This research study employs based on an online survey, design to investigate and compare the preferences of individuals in relation to virtual reality (VR) gaming and traditional video gaming. The primary purpose of this survey is to delve into the factors influencing individuals' choices between these two gaming options and to understand their overall preferences and favorability towards each.

A total of 15 questions were included in the survey (see Appendix A), covering various aspects related to gaming preferences, experiences, and perceptions. The questions encompassed different types, including multiple-choice questions, Likert scale rating questions, checkboxes, and open-ended questions.

The section begins with demographic inquiries, including age, gender, educational background, and geographic location. Following this, participants' gaming preferences are explored, encompassing their frequency of engagement in video gaming and their preference for either Virtual Reality (VR) gaming or traditional video gaming.

Specifically, the questionnaire delves into VR gaming preferences, investigating aspects that attract participants to this mode of gaming and whether they tend to play VR games alone or with friends. Additionally, participants are asked to share their perspectives on the future of VR gaming in comparison to traditional video gaming.

The survey then shifts to explore traditional video gaming preferences, examining factors that draw participants to this form of gaming and their inclination to play traditional video games individually or in a social context. Similar to the VR gaming section, participants are prompted to provide insights into their outlook on the future of traditional video gaming, considering the influence of emerging VR technology.

Lastly, open-ended questions invite participants to share additional thoughts and insights related to their gaming preferences and experiences. This organized approach in Appendix A ensures that the survey questions are presented comprehensively, allowing readers to easily grasp the range of inquiries and topics covered in the study.The survey provided a comprehensive platform to gather valuable insights into the preferences,

experiences, and perceptions of the participants regarding VR gaming and traditional video gaming.

The survey was strategically distributed, between 1st and 30th of April 2023, within various social media gaming communities, such as “VR gaming & Metaverse Exploration Community”, “Hardware & Gaming Morocco”, “PlayStation VR”, “Virtual Reality Community”…, to reach a wide range of individuals who actively engage in gaming. This distribution method ensured a targeted reach to respondents with diverse gaming backgrounds and interests. The online survey allowed for efficient data collection and quantitative analysis, enabling a large-scale examination of preferences.

Additionally, to gain deeper insights into the subject, interviews were conducted with a carefully selected group of 4 gamer volunteers from different nationalities, who have been recruited by reaching out to global gaming communities and forums on social media platforms. A specific message was shared in the 1st of May 2023, inviting volunteers to record short videos, contributing diverse perspectives to the research. These interviews provided qualitative data that complemented the quantitative findings, allowing for a more nuanced exploration of preferences, motivations, and experiences related to VR gaming and traditional video gaming. By employing both an online survey and interviews, this methodology ensured a comprehensive understanding of the preferences between these gaming options and enriched the analysis by capturing both quantitative and qualitative perspectives.

4.5.2 Data collection

The data collection for this study involved two primary methods: an online survey and online interviews.

The online survey was conducted using Google forms, which allowed participants to provide their responses conveniently and anonymously. The survey was designed with clear instructions and guidelines, ensuring consistency in data collection. Participants were instructed to answer the questions honestly and to the best of their knowledge.

The online interviews, on the other hand, were conducted remotely. The recruitment process for the participants involved reaching out to gaming communities in various social media platforms, seeking individuals with diverse nationalities and gaming backgrounds. Four volunteer accepted the request, and virtual meetings were arranged to present and discuss the survey questions. Each participant was requested to record a video response to the questions, capturing their insights and perspectives. These videos were then carefully edited to create a compilation of online interviews. These interviews followed a semi-structured format, allowing for flexibility while focusing on key themes and topics related to VR gaming and traditional video gaming. The interviews provided a platform for participants to express their preferences, motivations, and experiences in more depth.

The process took place over a 60-day period from 1th April to 31th May 2023, allowing sufficient time for participants to complete the online survey and recording the video interview. This timeframe was chosen to strike a balance between obtaining an adequate number of responses and ensuring timely completion of the study.

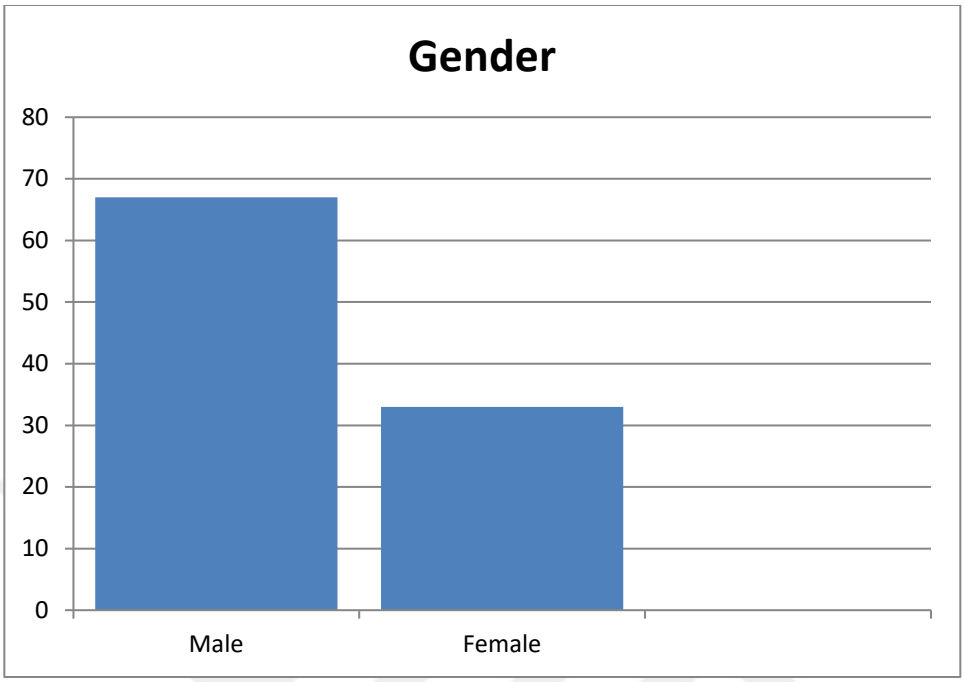
The online survey received an impressive response, with a total of 300 completed responses received from the targeted participant pool. The response rate achieved was calculated as the percentage of completed responses in relation to the total number of participants who were invited to take part in the survey. This response rate provides a strong basis for analysis and enhances the reliability and generalizability of the study findings.

4.5.3 Data analysis

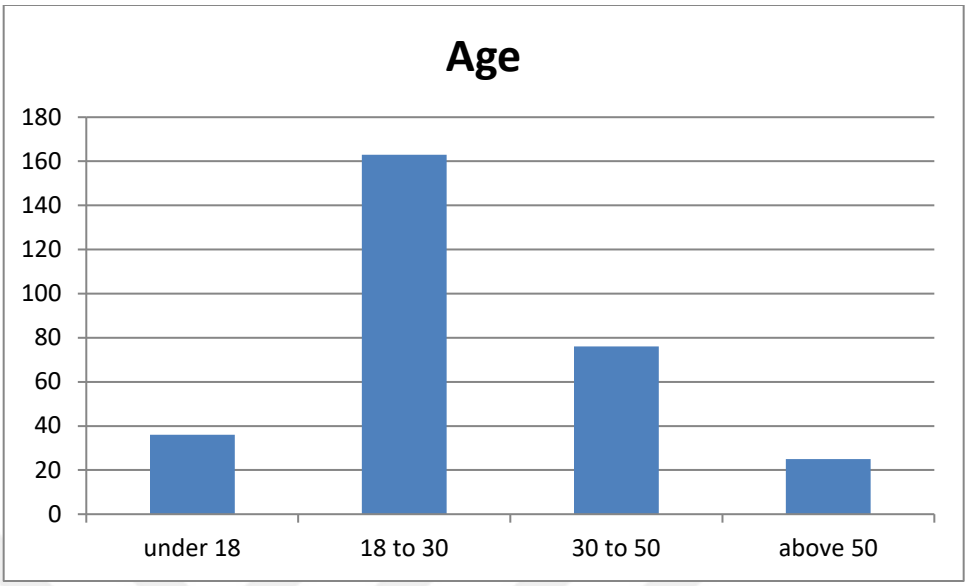
4.5.3.1 Quantitative analysis – General statistical findings

The survey data collected from 300 respondents provided valuable insights into the preferences and experiences of individuals regarding virtual reality (VR) gaming and traditional video gaming. The sample consisted of 67% males and 33% females, with the majority falling within the age range of 18 to 30 years (54%). The frequency of gaming varied, with 30% playing several times a week and 28% playing less than once a week.

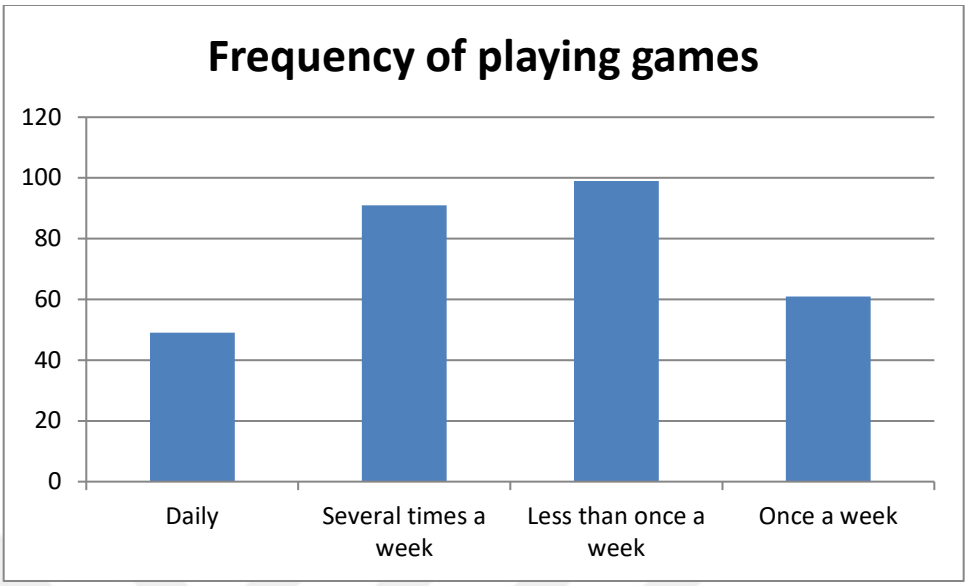
Among the respondents, 74% reported having tried a virtual game experience before. Those who had previous experience expressed a range of satisfaction levels, with 35.5% reporting being very satisfied and 20% extremely satisfied. Fun (79%), excitement (54%), and comfort (47%) were the dominant feelings associated with virtual gaming, although some reported negative effects such as nausea and eye strain. Notably, 70% of the respondents expressed a preference for virtual reality games over traditional video games. The primary reasons for this preference were better graphics and visuals (65%) and immersion and interactivity (45%). Moreover, a majority of the respondents (66.5%) believed that virtual reality would occupy the video gaming sector in the future. The study also revealed that 66% of the respondents were interested in trying more virtual reality games in the future. Overall, these findings provide valuable insights into the preferences and experiences of individuals in relation to VR gaming and traditional video gaming, as well as their positive outlook on the future of virtual reality in the gaming sector.



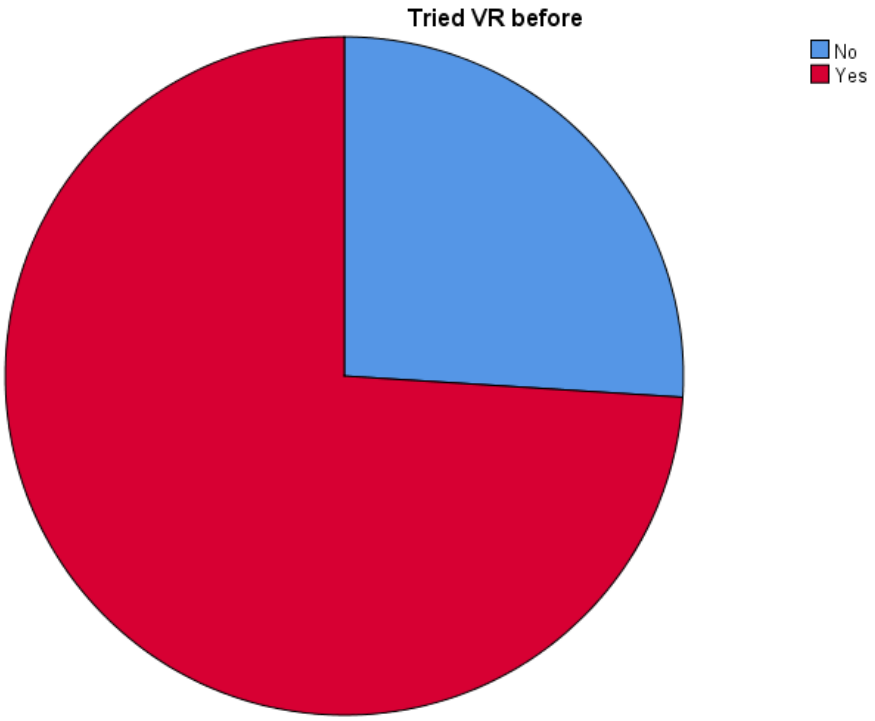
The study's participant distribution demonstrates a higher presence of males, accounting for 67%, while females represent 33%. This distribution aligns with prevailing gender trends within the gaming community.



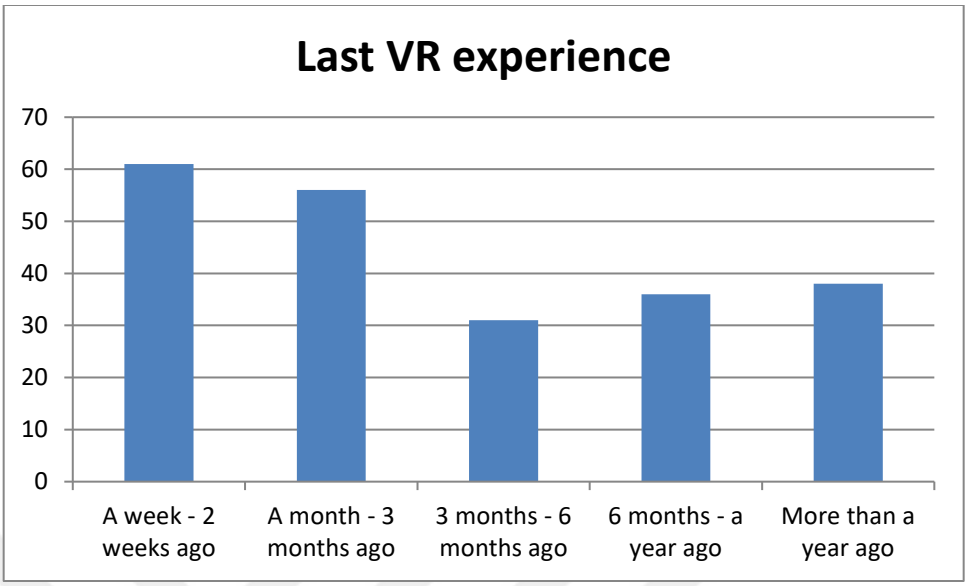
Age distribution among participants reveals that the majority, constituting 54.3%, fall within the 18 to 30 age bracket. Participants aged 30 to 50 account for 25.3%, while those above 50 and under 18 comprise 8.3% and 12% respectively. This distribution underscores a significant presence of younger participants, offering insights into preferences primarily from this demographic.



The distribution of participants' gaming frequency highlights varying levels of engagement within the study population. While a substantial portion engages in gaming on a less frequent basis, such as less than once a week (33.0%) or once a week (20.3%), a notable percentage plays games more regularly, including daily (16.3%) and several times a week (30.3%). This diverse range of gaming habits underscores the dynamic nature of participants' interactions with video games.

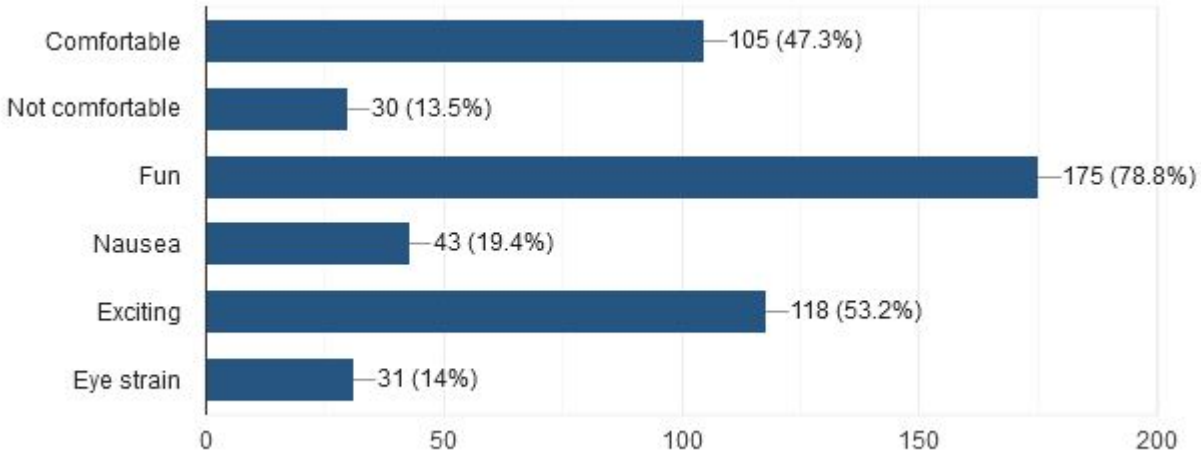


A significant majority, comprising 74.0%, have already tried VR gaming, indicating a widespread familiarity with immersive gaming experiences. However, a notable proportion, accounting for 26.0%, has yet to explore the realm of VR gaming.

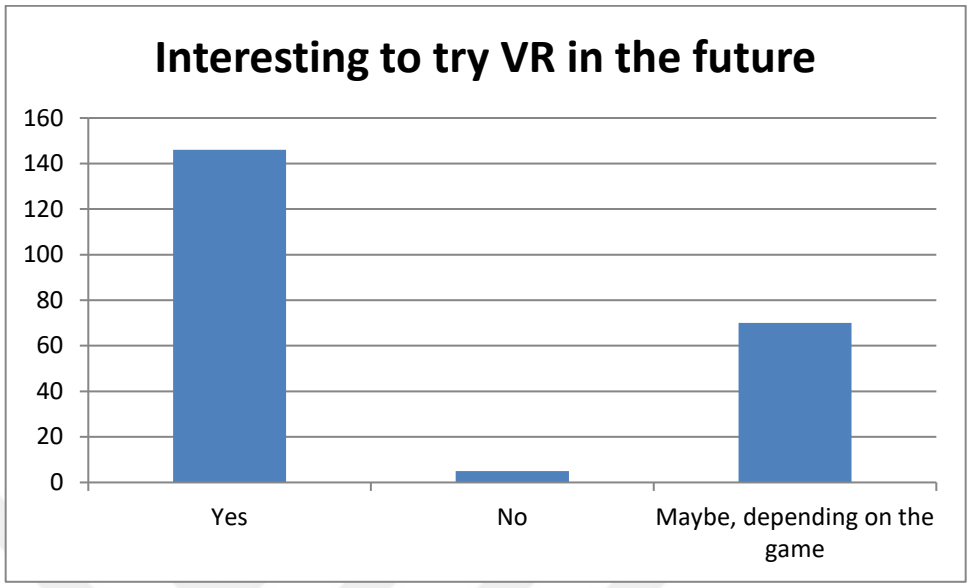


A notable portion of participants have engaged in VR gaming within the past few weeks, including both a week to two weeks ago (20.3%) and a month to three months ago (18.7%). Additionally, a significant number have experienced VR gaming within a longer timeframe, such as six months to a year ago (12.0%) or more than a year ago (12.7%).

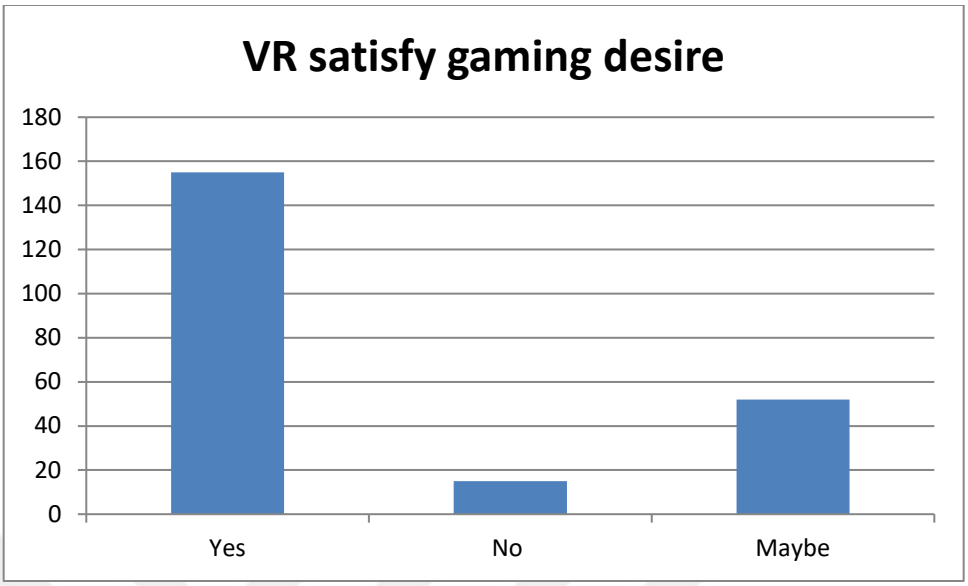
The satisfaction levels reported by participants exhibit a diverse range of sentiments. Notably, 15.0% express extreme satisfaction, while 26.3% indicate being very satisfied. On the other hand, a minority (1.7%) reports being not satisfied at all. Falling between these categories, 8.0% are slightly satisfied, and 23.0% remain neutral in their assessment.



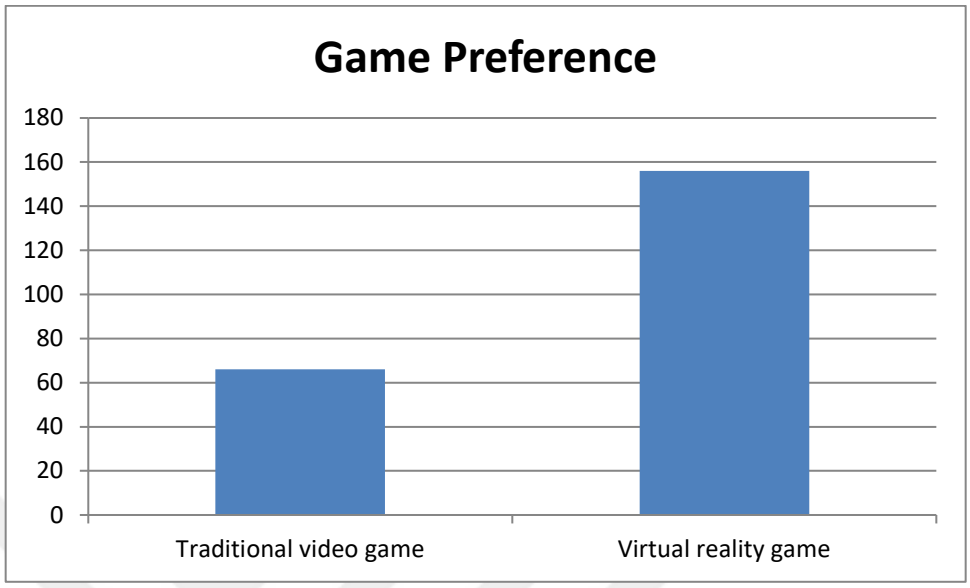
Feelings of experience



Looking forward to experimenting with VR in the future presents varied inclinations among participants. A significant portion (48.7%) expresses enthusiasm about this prospect. Conversely, a minority (1.7%) definitively rules out such endeavors. In the middle ground, 23.3% approach this possibility with a "maybe," contingent on the nature of the game.

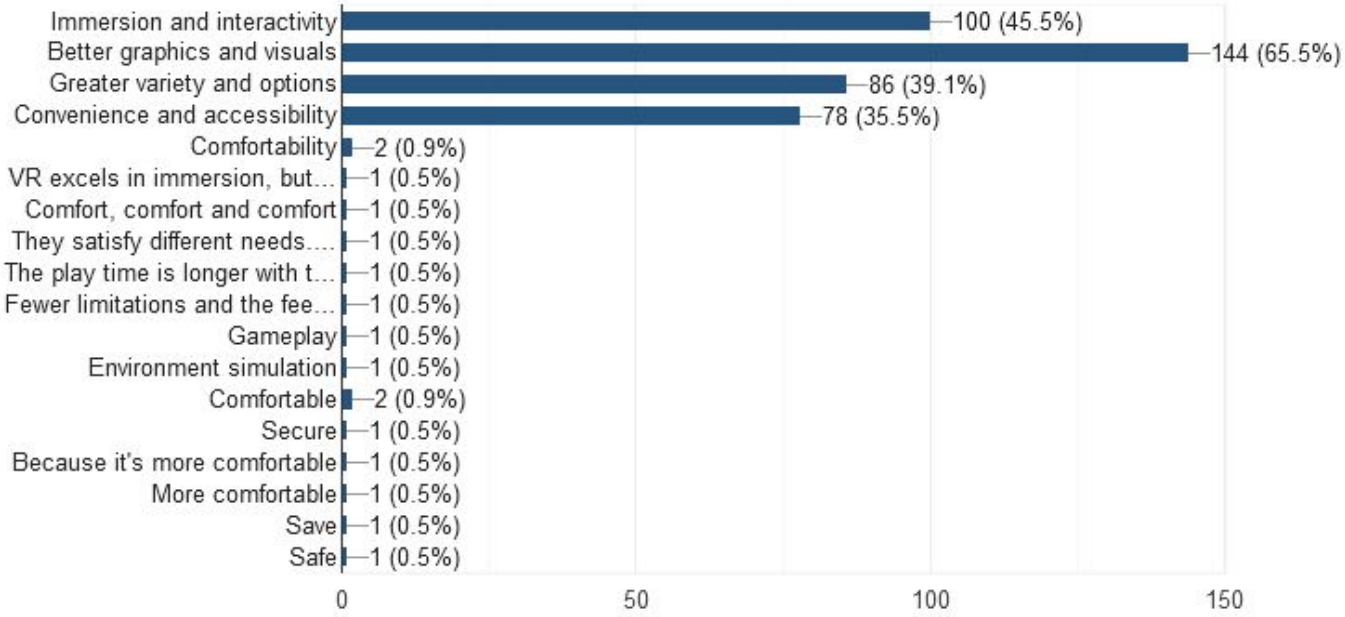


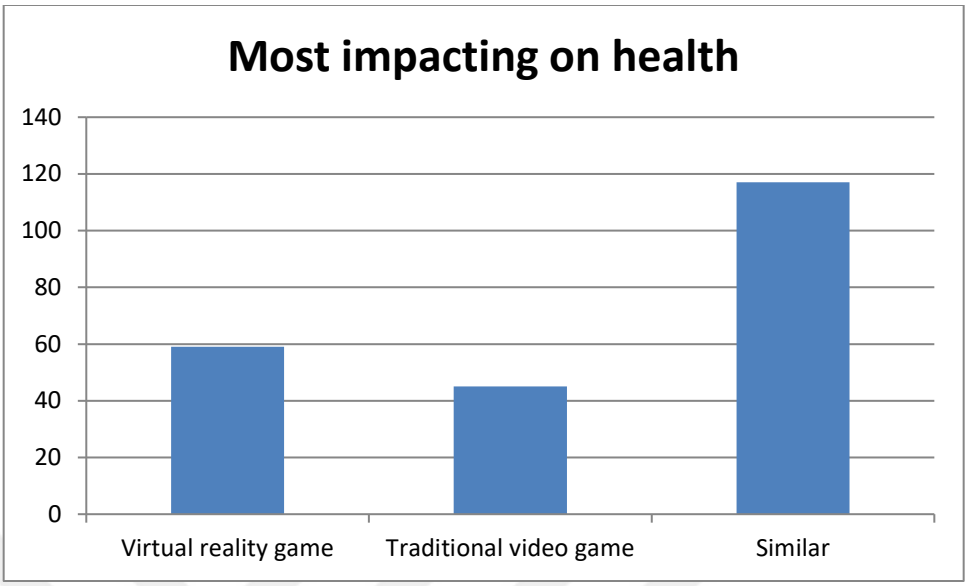
A significant majority (51.7%) finds that VR effectively satisfies their gaming interests. In contrast, a small number (5.0%) disagree with this idea. Meanwhile, 17.3% remain uncertain, indicating that the extent to which VR meets their gaming desires might depend on specific situations.



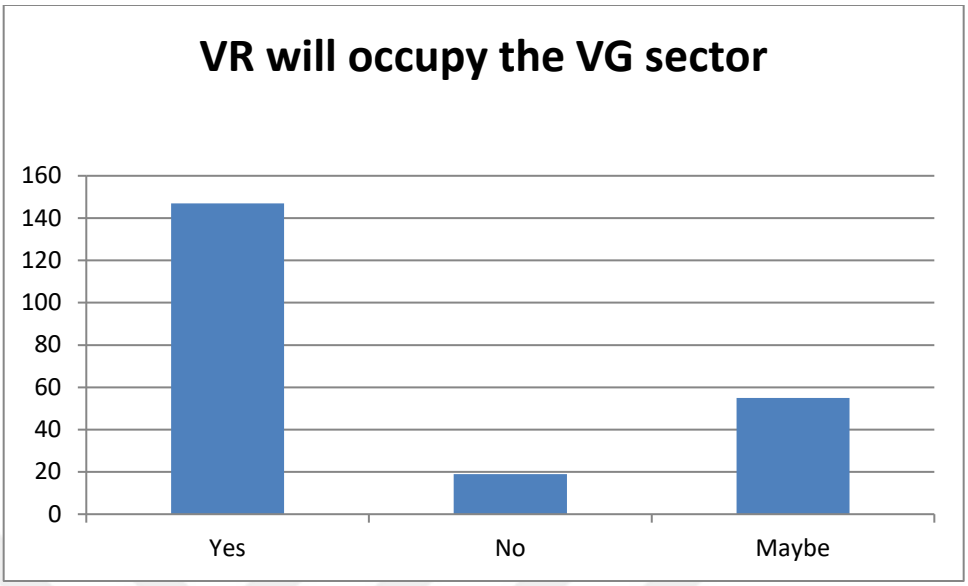
When it comes to game preference, a notable proportion (52.0%) leans towards virtual reality (VR) games. Comparatively, a smaller portion (22.0%) shows a preference for traditional video games. These percentages highlight the pronounced interest in VR gaming, while a significant number still holds on to the appeal of traditional video games.

Preference reason





In terms of their perceived impact on health, the largest share (39.0%) considers both options to be similar. However, a notable number attribute health impact to virtual reality (VR) games (19.7%), while a smaller group associates it with traditional video games (15.0%). This indicates that opinions vary regarding the potential health effects of different types of gaming experiences.



The prospect of virtual reality (VR) dominating the video gaming sector is met with diverse opinions. A significant portion (49.0%) believes that VR will indeed claim a substantial presence in the industry. On the other hand, a smaller fraction (6.3%) holds a contrary view, while 18.3% express uncertainty with a "maybe."

4.5.3.2 Qualitative analysis

In pursuit of nuanced insights, the qualitative phase of this research employed a purposive sampling approach, focusing on a carefully selected group of participants. Four individuals, each hailing from distinct nationalities; Jordan, Palestine, Morocco, and Macedonia, contributed invaluable perspectives to this analysis.

Initiated on April 1st and concluded on April 30th, this journey commenced with a targeted call for volunteers within VR gaming communities across various social media groups. A total of four members fervently responded to this request, each enthusiastic about sharing their experiences and opinions. These participants, drawn from geographically diverse backgrounds, infused a rich cross-cultural dimension into the analysis.

The experience of a 23 year old male Macedonian volunteer was strikingly vivid as he recounted his initial excitement upon entering the world of VR gaming. However, his enthusiasm took an unexpected turn as he encountered post-session discomfort in the form of headaches and nausea. This underscored the significance of the physical aspect of virtual reality immersion. The volunteer's poignant words echoed, 'The first time I tried VR gaming, I was incredibly excited, but after the experience, I felt a headache and nausea."

Similarly, the 21 years old Palestinian guy illuminated a distinct challenge: the financial barrier posed by VR gaming. Their perspective echoed a common concern among enthusiasts, indicating that cost remains a critical factor in the accessibility and widespread adoption of this technology. The volunteer expressed, "the only problem is that it was expensive."

Likewise, the perspective of a 27-year-old male volunteer from Morocco unveiled an intriguing dimension. For him, VR video games served as an escape from the rigors of real-life routines. He eloquently expressed how these virtual realms provided a respite, offering a refreshing divergence from the monotony of work and daily life. This perspective echoes the sentiment of many who seek solace and rejuvenation within the immersive experiences offered by VR gaming.

In the other side, the 20 years old guy from Jordan provided a thought-provoking insight into his perception of VR gaming. Reflecting on whether virtual reality could fulfill his gaming desires, he remarked, 'Yes, I think that virtual reality is an upgrade of gaming. I've tried a scary game before, but I still have to experience more VR games to fully articulate my satisfaction.' This perspective encapsulates the anticipation and curiosity that many enthusiasts hold, as they navigate the uncharted territories of immersive gaming experiences.

Such candid testimonies not only exemplify the range of responses elicited but also emphasize the tangible impact of factors like physiological comfort and economic accessibility on user experiences. Rooted in the purposive sampling method, this qualitative analysis resonates as a representative narrative, navigating the delicate balance between excitement and challenges that define the VR gaming landscape.

This insightful exploration stands as a profound testament to the thoughtfully orchestrated participant selection process. The array of perspectives underscores the potential avenues of exploration that the amalgamation of cross-cultural diversity and individual experiences can uncover within the realms of virtual and traditional gaming preferences.

4.5.4 Evaluation of the findings

The research delves into the distinct preferences that gamers exhibit, segregating them into two primary categories: those who find gratification in virtual reality (VR) gaming and those who are inclined towards traditional video games. These two groups exhibit contrasting inclinations, shaped by various factors that influence their gaming experiences.

Fans of VR gaming are drawn to its unique immersive quality, which guides them into a virtual realm, facilitating gameplay that feels markedly different from traditional formats. On the contrary, proponents of conventional video games opt for the familiarity of established gaming methods, appreciating the straightforward approach they offer.

The perception of health impacts diverges among gamers. While some perceive VR gaming as a physically engaging endeavor that contributes positively to their well-being,

others assert the benefits of traditional gaming, highlighting its capacity to provide entertainment without the need for extensive physical involvement.

In contemplating the future path of the gaming world, different opinions arise. Some gamers anticipate a rise in VR gaming's appeal, recognizing its capacity to transform the industry. On the flip side, doubts persists among certain circles, questioning how widely VR will be embraced.

Ultimately, the variances in players' preferences are underpinned by a myriad of influences, encompassing technological innovations, the level of engagement, and individual predilections. This study serves as a compass, shedding light on the intricate reasons underlying the choices individuals make in the gaming sphere. As the gaming realm continues to evolve, this research offers valuable insights into the dynamics of player preferences and their evolving relationship with gaming technologies.

5. Conclusion

This thesis has delved into the realm of virtual reality (VR) gaming, unraveling its intricate significance within the dynamic tapestry of the gaming industry's evolution. As we peer through the lens of technological progress, the enduring relevance of VR gaming comes into sharper focus, inviting continued exploration and innovation that resonates far beyond the confines of screens and controllers.

In contemplating the trajectory of the gaming landscape, there was diverse perspectives that mirror the enigmatic allure of virtual realms. Some gamers envision VR gaming as a harbinger of transformation, a potent force capable of reshaping the very essence of the industry. This echoes the sentiments of gaming visionary Shigeru Miyamoto, who once remarked, "Video games are bad for you? That's what they said about rock-n-roll."

Yet, amidst the tide of anticipation, echoes of skepticism reverberate in certain quarters, questioning the extent of VR's ascendancy. These doubts are reminiscent of the philosophical musings of Johan Huizinga, who eloquently explored the profound essence of play in the human experience. As navigating this realm of uncertainty, the words of Huizinga remind us that "play is older than culture, for culture, however inadequately defined, always presupposes human society, and animals have not waited for man to teach them their playing."

In the symphony of gaming preferences and experiences, VR technology emerges as a captivating crescendo. Its immersive allure, akin to the eloquent brushstrokes of an artist, paints a canvas of possibilities that transcend conventional paradigms. This echoes the philosophical underpinnings of Miguel Sicart, who poignantly asserted that "game designers are engineers of soul." VR gaming, with its intricate blend of technology and artistry, forges a path that invites us to peer deep into the labyrinth of human emotions and desires.

As the sun sets on this study's exploration, a quote by Jane McGonigal calls out like a beacon, guiding us into the uncharted territories of gaming's future: "Games are the only force in the known universe that can get people to take actions against their self-interest, in a predictable way, without using force."

In conclusion, this thesis uncovers the layers of VR gaming's profound impact and beckons us to ponder its potential to reshape not only the gaming industry but the very fabric of human experiences. It is a realm where skepticism and anticipation intertwine, where technological prowess and philosophical depth converge, offering a glimpse into the evolving narrative of play and exploration.

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Appendix A: Questions of the survey

1. **Your gender is** *

- ☐ Male
- ☐ Female

2. **Your age is** *

- ☐ Under 18
- ☐ 18 to 30
- ☐ 30 to 50
- ☐ Above 50

3. **How often do you play video games or virtual reality games?** *

- ☐ Daily
- ☐ Several times a week
- ☐ Once a week
- ☐ Less than once a week
- ☐ Other:

4. **Did you ever try a virtual game experience before?***

- ☐ Yes
- ☐ No

****Virtual Gamers**

5. **How long has it been since your last virtual game experience ?** *

- ☐ A week - 2 weeks ago
- ☐ A month - 3 months ago
- ☐ 3 months - 6 months ago
- ☐ 6 months - a year ago
- ☐ More than a year ago

6. **How was your experience of playing virtual games?** *

- ☐ Not satisfied at all
- ☐ Slightly satisfied

- ☐ Neutral
- ☐ Very satisfied
- ☐ Extremely satisfied

7. **How was your feeling about your virtual game experience?** *

- ☐ Comfortable
- ☐ Not comfortable
- ☐ Fun
- ☐ Nausea
- ☐ Exciting
- ☐ Eye strain

8. **Would you be interested in trying more virtual reality games in the future?***

- ☐ Yes
- ☐ No
- ☐ Maybe, depending on the game

9. **Do you think this virtual technique of playing can satisfy your desire to play games?** *

- ☐ Yes
- ☐ No
- ☐ Maybe

10. **Which type of game do you prefer?***

- ☐ Traditional video game
- ☐ Virtual reality game

11. **What is the primary reason for your preference?**

- ☐ Immersion and interactivity
- ☐ Better graphics and visuals
- ☐ Greater variety and options
- ☐ Convenience and accessibility
- ☐ Other:

12. **What are the most negative affects you have encountered in your virtual gaming experience?***

13. **What are the most positive affects you have encountered in your virtual gaming experience?***

14. **Which type of game do you think have an impact on mental/physical health?***

- ☐ Virtual reality game
- ☐ Traditional video game
- ☐ Similar

15. **Do you think Virtual reality will occupy the video gaming sector in the future?** *

- ☐ Yes
- ☐ No
- ☐ Maybe