

Virtually connected in a Multiverse of Madness?

- Perceptions of Gaming, Animation, and Metaverse

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Abstract: Few studies analyze what are the common representations of the Metaverse. Regarding what has been said about this concept, our research aims to verify how adults' percept and represent the Metaverse. We carried out a study with focus groups, having as participants Portuguese adults all considered habitual gamers (or users of digital games). The objectives for this study were seven: verify how the Metaverse is being represented and characterized; identify which technologies that stimulate the immersion experience; identify the main dimensions that influence the acceptance of the Metaverse concept; understand the perceptions of Metaverse and virtual reality regarding socialization and well-being; verify the perceptions of a gamer's daily lives regarding the Metaverse, virtual reality, and gaming concepts; understand the impact of social representations on the gaming concept; to understand the perceived role of animation regarding the Metaverse, virtual reality, and gaming concepts. Our results reveal a common understanding of the Metaverse, despite some confusion about this concept. We also verified the high importance of well-being and social dimensions in the Metaverse immersive experiences provided by technology or gaming characteristics. This exploratory study gave us essential findings about the perceptions of the Metaverse and a deep understanding of the relations between Metaverse, virtual reality, animation, and gaming.

Keywords: Metaverse; virtual reality; animation; digital games; gaming; qualitative research.

1. Introduction

Over the years, the gaming industry has become a fulcrum for technological development with the premise of reaching higher player engagement. With this evolution, our reality has been transformed by virtual reality through animation, where virtual characters assume almost real roles, new realities are generated, as well as languages and new types of communication [1]. Whether a single individual or global, the perception must be understood ethically and even politically [2].

This virtual reality brought by animation through the gaming world is considered a dream [3][3] by the author Heilig of its power to transform reality. And so we become aware of how digital transformation has come into our lives because of the Metaverse [4]. The gaming industry has founded this concept because we are enveloped with alternate worlds [5], considered the first areas where Metaverse solutions were applied [5]. In this way, the Metaverse concept has brought us a whole new perspective of reality, uniting the technology to create new immersive ways to live our lives [6].

Nevertheless, only a few studies focus on trying to understand the real perceptions, by ordinary people, of the concept of the Metaverse. Do regular people understand the impact of the Metaverse in their lives and how important this can be in the future? Until the present date, even the authors have yet to come up with a precise definition for this concept, so if a consensus between them is still waiting to happen, should we expect that

Citation: To be added by editorial staff during production.

Academic Editor: Firstname
Lastname

Received: date
Revised: date
Accepted: date
Published: date



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other people will understand this concept better? As investigators, we aim to understand the balance between the scientific knowledge of this concept and the common understanding.

So we ask, what are the thoughts of the gamers? What are their common thoughts regarding this concept? Is scientific knowledge aligned with common thoughts? Or are two apart visions being created?

This research aims to contribute to a better understanding of how this Metaverse concept is being perceived, giving the scientific knowledge of how common assumptions could or should be explored regarding the definition of this concept. And to provide the technology and gaming industry with crucial ideas on which concepts they should be guided to future evolution. This study may also be useful for common users or gamers to reflect on their motivation to seek the Metaverse and on how they use games and virtual reality, considering their socialization in the real world versus immersion in virtual environments – understanding people's perceptions may contribute to better communication linking the real and virtual worlds to proportionate a better involvement and socialization (beyond any distance or physical barrier).

This explorative study is part of extensive research on the Metaverse, virtual reality, and gaming concepts. So, we ask: How is the Metaverse being perceived and represented by gamers?

Since this is an explorative study and a part of a Ph.D. in development, the objectives proposed for this study were elaborated using previous investigations already made, and objectives were pre-defined according to our Ph.D. thesis.

With this context, we aim to: 1) verify how the Metaverse is being represented and characterized; 2) identify which technologies that stimulate the immersion experience; 3) identify the main dimensions that influence the acceptance of the Metaverse concept; 4) understand the perceptions of Metaverse and virtual reality regarding socialization and well-being; 5) verify the perceptions of a gamer's daily lives regarding the Metaverse, virtual reality, and gaming concepts; 6) understand the impact of social representations on the gaming concept; 7) to understand the perceived role of animation regarding the Metaverse, virtual reality, and gaming concepts.

This study consisted of three focus groups, with Portuguese adults, all considered regular gamers (or users of digital games). The qualitative data gathered were analyzed using frequencies. We aimed to identify the main emerging themes and concepts, helping us explore what can be done in the future and discover more about these concepts.

The present study is framed in a general introduction and a brief literature review. After these, we present a detailed exploration of the methodology applied to the frequent themes and main concepts that result from the focus groups we analyzed. After this, we present the findings of this study, followed by a discussion considering the present results and a conclusion, including suggestions for future work.

2. Background

2.1. Gaming

The gaming notion begins with technological evolution and engagement with video or digital games. The gaming area has been with us for a long time [7], and with its evolution, it has responded to all our wishes, offering new environments, experiences, and opportunities [8]. Gaming has been considered the founder of the Metaverse as an entertainment tool since it was one of the first solutions where this concept was applied [5].

To understand the gaming concept, we must embrace ourselves through the notion of playing. Playing is a free activity where joy and fun exist [9]. However, it does not need to have a goal. All the rules created rely only on the person or person playing the imagination [9]. So, another view of playing is being in this world to comprehend what is around us, who we are, and a way to interact with others [10].

In this way, we can understand that the gaming area is something that has been present for a long time [7] and has responded to our wishes and experience needs [8], becoming more social and sharing experiences [11]. The gaming world allows us to explore different experiences where we free ourselves from the limits of our bodies and our previous experiences and extend ourselves to infinite possibilities [12].

It's also essential to understand the social importance of the gaming area because most people play video games with others [13]. Players prefer to play with other players [14], and communication is more fun, involvement, and bond when people are connected [15]. There is a unique opportunity for sociability and social games, making them the only media means that allows this active activity together [16].

With this understanding, we can see the gaming industry's efforts continuously growing through the years, allowing new concepts to be born because of technological development. As humans, we are continually staged by our social contexts, and we cannot central or surpass them. However, the gaming world offers alternative worlds that distance the social rules and quotidian.

2.2. Virtual Reality

Virtual reality has been one of the concepts and development technology that was launched through the gaming area. The term engineers use is virtual, which means substitute computers and peripheral devices instead of human senses [17]. So virtual reality can be seen as a technology that can replace a user's primary senses for computer data [18]. It's also considered an electronic simulation of experienced environments [19], allowing users to get different sensory experiences of real things through simulation, but it does not mean a new experience can occur [17]. It can be seen as an artificial reality from the actual world [17].

Virtual reality relies on computer graphic systems combined with different displays and interface devices that allow immersion through a 3D computer-generated environment [20]. It's considered a new medium only possible by the technological advances creating practical applications and new ways of communication [21]. Virtual reality profoundly impacts daily human lives because humans will constantly challenge the limits of existing technology and optimize the combination of resources to push the progress of science and technology forward [22]. Virtual tools provide various means of accessing, viewing, and analyzing data within a focal point to offer spatiality, immersion, and interaction [23].

To understand virtual reality best, we must understand its key important elements. One key element is the participants because all the virtual reality magic happens in their minds. This experience is not the same for each participant because of their experiences, culture, and history [21]. Then we have the creators, as the second key element, without the person or team that designs and implements the created work to be experienced [21]. The third key element is the virtual world. It's considered the content of a given medium and can exist without being displayed in a virtual reality system. When we observe that world through the possibility of bringing objects and interactions in a physically immersive, interactive way, we experience it via virtual reality [21]. The fourth key element is immersion, the sensation of being in an environment that can be a mental state or accomplished physically. Physical immersion is considered a characteristic that defines virtual reality [21]. The fifth, and last key element, is interactivity because it allows alternate realities through computers, games, and other systems or devices [21].

Virtual reality is seen as an advanced human-computer interaction interface that allows the simulation of realistic environments [24]. This interactivity can also be defined as communication media because users can modify a form or content mediated by the environment in real-time [19]. This concept can have different forms, such as cab simulation, projected reality, augmented reality, telepresence (the feeling of being physically somewhere other than where the user is [25]), and desktop virtual reality (keyboard, mouse, monitor, headphones) [24].

2.3. Animation

We now understand the virtual reality existing in the gaming world; however, we must take some time to understand the core of the gaming existence, which is the animation.

The connection between the gaming area and the animation started because of the economy around them. The first to explore this relationship was Walt Disney [26], and by seventy years, the commercial license became a possibility [27]. By this means, digital technology with special effects such as animation broke an essential psychological barrier because it allowed virtual worlds [26] to exist.

Animation has brought to the gaming world and virtual reality all its meaning “to give life”. It’s an extraordinary audiovisual expression that transforms non-real events and takes the audience there [28]. Animation has excellent potential and importance because of its ability to establish transversal communication with any age, gender, culture, religion, or nationality [29]. Because of this ability, the animation is considered a creative strategy [30] and a new model of communication for the future [28].

2.4. Metaverse

After our dive through the gaming area and the technological development (virtual reality and animation concepts), we arrive at the main concept of this investigation, the Metaverse.

The Metaverse concept definition appeared for the first time by the author Neal Stephenson in his book *Snow Crash* in 1992. It was defined as a virtual world that could reach, interact and affect human existence [31]. However, till today there has yet to be a consensus about the Metaverse definition, but there are definitions near agreement in the future. The Metaverse can be defined as a massive dimension network and interconnected 3D virtual worlds rendered in real-time that can be experienced synchronously and persistently by an unlimited number of users with a unique sense of presence and data continuity, has identity, history, rights, objects communication and payments [31]. It’s also a 3D experience where we can interact with virtual and augmented reality through headsets, sensory gloves, cameras, and sensors registering our bodily movements [8].

The Metaverse has its inner world that continues to exist even if we are not connected [8]. It can be described as the layer between us and the reality [32], where a 3D virtual world is shared, and the experiences can be experienced through virtual and augmented reality [33]. It’s based on the real world but without physical limitations [34]. The users can involve themselves socially, economically, and culturally through their avatars [35] because the Metaverse unites platforms of socially immersive virtual realities compatible with video games with massive online multi-players, open gaming worlds, and collaborative spaces of augmented reality [36]. It’s also seen as a digital universe that mixes online gaming elements with social networks and virtual reality, allowing users to engage digitally [37].

The Metaverse social application will transform social networks [18], and we can see that the gaming world is the founder of this concept because gamers could tie it to the screen and envelop it with alternative worlds [6]. The gaming experience has increasingly become a lived experience, and the limits between the Metaverse and what is gaming and what is not have disappeared [8]. The Metaverse can be achieved via the internet through augmented reality devices, game consoles, computers, tablets, or mobile phones [4]. In this way, the Metaverse concept is present consciously or unconsciously in our lives.

2.5. Related Work—A Comprehensive Review of Main Concepts

To understand the relationships between the main concepts, in this section, we connect these concepts with the objectives of the present study. Tables 1–4 were structured to help us to observe the relations of the concepts (Gaming, Virtual Reality, animation and Metaverse) and their definitions studied by scientific authors according to our objectives,

which are to: 1) verify how the Metaverse is being represented and characterized; 2) identify which technologies that stimulate the immersion experience; 3) identify the main dimensions that influence the acceptance of the Metaverse concept; 4) understand the perceptions of Metaverse and virtual reality regarding socialization and well-being; 5) verify the perceptions of a gamer's daily lives regarding the Metaverse, virtual reality, and gaming concepts; 6) understand the impact of social representations on the gaming concept; 7) to understand the perceived role of animation regarding the Metaverse, virtual reality, and gaming concepts.

Table 1. Related Work—Concept Gaming.

Author	Description	Concept Relation	Objective Alignment
[8]	has responded to all our wishes, offering new environments, experiences, and opportunities	Gaming	(3) (4)
[5]	Gaming has been considered the founder of the Metaverse as an entertainment tool since it was one of the first solutions where this concept was applied	Gaming vs Metaverse	(3) (4) (5)
[9]	Playing is a free activity where joy and fun exist	Gaming	(4)
[11]	becoming more social and sharing experiences	Gaming	(4) (5) (6)
[13]	It's also essential to understand the social importance of the gaming area because most people play video games with others	Gaming	(4) (5)
[15]	communication is more fun, involvement, and bond when people are connected	Gaming	(2) (4) (5) (6)

Table 2. Related Work—Concept Virtual Reality.

Author	Description	Concept Relation	Objective Alignment
[17]	The term engineers use is virtual, which means substitute computers and peripheral devices instead of human senses	Virtual Reality	(2) (4)
[18]	virtual reality can be seen as a technology that can replace a user's primary senses for computer data	Virtual Reality	(2)
[19]	considered an electronic simulation of experienced environments	Virtual Reality	(2)
[20]	Virtual reality relies on computer graphic systems combined with different displays and interface devices that allow immersion through a 3D computer-generated environment	Virtual Reality	(2) (5)
[21]	It's considered a new medium only possible by the technological advances creating practical applications and new ways of communication	Virtual Reality	(2) (4) (5)

[21]	Physical immersion is considered a characteristic that defines virtual reality	Virtual Reality	(2) (4) (5)
[19]	This interactivity can also be defined as communication media because users can modify a form or content mediated by the environment in real-time	Virtual Reality	(2) (4) (5)
[25]	This concept can have different forms, such as cab simulation, projected reality, augmented reality, telepresence (the feeling of being physically somewhere other than where the user is	Virtual Reality	(2)
[24]	desktop virtual reality (keyboard, mouse, monitor, headphones)		(2)

Table 3. Related Work—Concept Animation.

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Author	Description	Concept Relation	Objective Alignment
[26]	The connection between the gaming area and the animation started because of the economy around them. The first to explore this relationship was Walt Disney	Animation	(6)
[26]	By this means, digital technology with special effects such as animation broke an essential psychological barrier because it allowed virtual worlds	Animation	(3) (7)
[28]	It's an extraordinary audiovisual expression that transforms non-real events and takes the audience there	Animation	(7)
[29]	has excellent potential and importance because of its ability to establish transversal communication with any age, gender, culture, religion, or nationality	Animation	(6) (7)
[30]	of this ability, the animation is considered a creative strategy	Animation	(7)
[28]	new model of communication for the future	Animation	(7)

Table 4. Related Work—Concept Metaverse.

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Author	Description	Concept Relation	Objective Alignment
[31]	virtual world that could reach, interact and affect human existence	Metaverse Vs Virtual Reality	(1) (2) (4) (7)
[31]	The Metaverse can be defined as a massive dimension network and interconnected 3D virtual worlds rendered in real-time that can	Virtual Reality	(1) (4) (5)

	be experienced synchronously and persistently by an unlimited number of users with a unique sense of presence and data continuity, has identity, history, rights, objects communication and payments		
[8]	It's also a 3D experience where we can interact with virtual and augmented reality through headsets, sensory gloves, cameras, and sensors registering our bodily movements	Metaverse Vs Virtual Reality	(1) (2) (7)
[8]	its inner world that continues to exist even if we are not connected		(1)
[32]	It can be described as the layer between us and the reality		(1) (4) (5)
[33]	where a 3D virtual world is shared, and the experiences can be experienced through virtual and augmented reality		(1) (2) (7)
[34]	based on the real world but without physical limitations		(1) (4) (5)
[35]	The users can involve themselves socially, economically, and culturally through their avatars		(1) (3) (4) (5)
[36]	Metaverse unites platforms of socially immersive virtual realities compatible with video games with massive online multi-players, open gaming worlds, and collaborative spaces of augmented reality		(1) (2) (4) (5) (7)
[37]	It's also seen as a digital universe that mixes online gaming elements with social networks and virtual reality, allowing users to engage digitally		(1) (2) (3) (4) (7)
[8]	The gaming experience has increasingly become a lived experience, and the limits between the Metaverse and what is gaming and what is not have disappeared		(1) (3) (4) (5) (7)
[4]	The Metaverse can be achieved via the internet through augmented reality devices, game consoles, computers, tablets, or mobile phones		(1) (2) (5)

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2.6. Qualitative Research - Focus Group

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The focus group originated in the work of the Bureau of Applied Social Research at Columbia University in 1940 [38]. It has become common in research since 1990. It can be applied to various disciplines such as education, communication and media, health, youth, ecology and conservation, feminism, sociology, and social psychology [39]. The focus group is a qualitative data collection method that engages a small number of people in an informal discussion around a particular topic [39]. It's considered a non-standard technique to gather information based on what appears to be an informal discussion among a group of selected people [40]. This discussion occurs in the presence of a

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moderator that leads and focuses the discussion on the research issues [40]. There must be prior planning, leaving it up to the researcher to determine which questions to approach and discuss, with attention to the group. These questions are scheduled, and the moderator is responsible for facilitating participation by the discussion group members [39]. The focus group stimulates the creation of discourses between the participants that may never occur in real life, quickly achieving a large amount of data. This method is considered very efficient for gathering data [41]. Discussion groups are defined by a small number of individuals gathered for a discussion, making them more valuable overall than a sample representative [42]. In a group, collective discussion brings together each individual's sphere of life, and these are confronted with disagreements, making this method more critical than any other. Human behavior remains normative, what changed are the sources of normative influence that are more diverse, complex, and interactive [43].

Focus group discussion effectively provides information about what people think or feel and how they do it [44]. A group, per se, is not considered good or bad but reflects human capabilities. Any discussion group can be viewed as a focus group if the investigator actively encourages and listens to group interaction [45]. The interactions within the discussion group enable the exploration of stabilized forms of socially shared knowledge, tensions, and different meanings within the same shared understanding and the reinterpretations of the symbolic forms of the social knowledge [40]. The great potential of focus groups is the explicit use of group interaction to produce data and thoughts that would be less accessible without the interaction found in a group [41]. It can be used as a single-method investigation or in combination with other methods. This helps guide a study to generate hypotheses based on the informant's opinions, thoughts, and feelings, assessing different populations, or developing questionnaires – as in our case – based on participants' views, suggestions, and interpretations.

The focus group can be used as a simulation of speech and conversations of everyday life or as an almost natural method to study the generation of social representations or social knowledge in general [46]. This discussion type is considered closer to the everyday communication [40]. This method generates discussion and therefore reveals the meanings that people read in the topic of debate and how they negotiate these meanings. It creates diversity and difference within or between the group, revealing the dilemmas of everyday arguments [46]. The number of focus groups to be carried out should be evaluated according to the interests and objectives research [47]. We need to remember the group chosen to bring the social category with which the individual participants can identify that they are part of a member of a specific social group [40]. And the group is also considered a unit of analysis because it represents the social group the researcher wants to investigate [40]. Depending on the type of investigation, Focus groups can be used, as a method, on their own or in combination with other methods (e.g., surveys, observations, and single interviews) [48].

The development of communication and information research practices technologies has significantly impacted [48], and the focus group has been naturally transferred to the internet research [40]. The online focus group can be distinguished into synchronous (real-time) or asynchronous (non-real-time) groups. Synchronous groups require all participants to be online simultaneously using a chatroom or conferencing software [48]. In this case, a possible issue could be the reduced flow of the discussion and the availability of visual information [49]. However, some software can enable the transmission of relatively nuanced expressions and emotions in video mode [50] and are able to replicate real-time, face-to-face interaction [51]. The asynchronous groups must be provided with the software on their computer, and the participants do not have to be all online. This has some disadvantages causing technical issues or hesitation to install this software [48]. The number of participants in the real-time focus group should be limited, causing the discussion to be too fast and superficial [48]. Differences between online and face-to-face focus-group research concerning group interaction and the ability to obtain

information are eroded as technology provides more significant opportunities to create a social presence online [49].

Online focus groups have advantages, such as logistical issues, because the difficulty of having all participants at the same place and time is reduced by technology [52], [53]. Recording and transcriptions were also facilitated by built-in online interfaces, which can be downloaded almost immediately [49], [50], and automatic recording allows the possibility of pre-classifying the collected information [40]. Sensitive issues, the anonymity of virtual groups can create a high sense of psychological safety for sensitive or embarrassing topics [51]. Limitation of interaction biases, online interaction can control some tendencies and prevent participant conflicts or competitiveness [40]. Adaptability for specific targets, online focus groups can be appropriate for particular types of participants, such as teens, low-incidence groups, professionals, policymakers, and disabled individuals [49].

As for the disadvantages, we can point to the digital gap, choosing participants with some familiarity concerning technology implied in an online focus group. The artificiality of the interaction situation is that participants may feel concerns about sharing personal information with strangers in an electronic context [50]. And the lack of non-verbal communication may reduce the non-verbal communication that plays a crucial role in eliciting responses [49].

Nevertheless, the online focus group may lead to more disclosure than real-world groups. Data is easier to document, and the loss of contributions due to audibility problems during the transcript can be reduced [48]. Online focus groups make data analysis relatively easy through coding and categorization [48].

Regarding the sample size of the focus group, we already know that this method is considered a qualitative technique that collects data very efficiently [54]. But when do we know it's enough?

We can make out a little in qualitative research because we do not try to generalize a population but to identify social processes [55]. It's also essential to consider the saturation point concept, considering the point at which gathering new data does not provide any new theoretical insights into the studied phenomenon [56], [57]. So it does not matter how little data we have collected, we have to consider the generalizations that can be made from just one single case. We should focus on our interactive units (such as social relationships, encounters, and organizations) because these units allow a direct and deeper analysis of the characteristic observed [58]. The saturation concept is important in previous studies regarding focus group samples. In a study whose objective was to assess the saturation and guidance on focus group research, it was found that one focus group generated 64% of the theme/concepts and that three focus groups generated 84%, concluding that three focus groups are enough to identify the most prevalent concepts [59]. In another study relating to influence saturation, the authors concluded through their research that only a few groups are required to capture the breadth of the main issues [60].

For this reason, we decided that three focus groups were enough to collect the main concepts for our explorative study.

3. Methods

3.1. Data Gathering – Focus Group

This study consists of three synchronous online focus groups, with a total of 13 participants of Portuguese nationality. For choosing the participants, we used as inclusion criteria: 1) being a gamer (plays digital or videogames regularly); 2) being young adults or adults; 3) having some knowledge regarding video-conference tools. As for the exclusion criteria: 1) did not match all the inclusion criteria mentioned; 2) needed access to a computer with internet to participate in the online focus group. There were seven males and six females, with an average age of twenty-nine. Google Meet was the software chosen to make the video conference.

The questions were revised for each focus group depending on difficulties observed and on the understanding of what was asked in the previous focus group made. However, we never interfered with the line of ideas or suggested a response. For example, one question clarified the meaning of Metaverse because participants asked directly if the Metaverse was the concept itself mentioned or if it was the Facebook company changing to Meta name. In a general way, all the participants understood what was questioned immediately.

The focus groups comprised twenty-eight questions, divided into three main themes, Gaming, Animation, and Metaverse.

For the Gaming theme, we had these questions prepared:

1. What is it for you to play?
2. What is the gaming world for you?
3. What is a gamer for you?
4. What do you think about there being different types of gamers?
5. How do you feel/think that the gaming world is present in our daily lives?
6. What do you think/feel about the statement “a game is a virtual reality”?
7. What do you think/feel about the possibility of social reality being an important factor in choosing a game in favor of others?
8. When you play, do you feel immersed (“inside”) in the game?
9. How do you relate playing with your everyday reality?
10. How do you relate playing with Animation and the Metaverse?
11. To what extent do you feel immersed in a virtual world while playing the game? As? Why?
12. What are the most fascinating features for you to play?
13. What are the most important features in a game to feel more immersed?
14. Do you know or use any objects/technologies that provide immersion in a game?

For the theme Animation, the questions were:

1. What do you think/feel about the statement “animation is present in all games”?
2. Do you consider Animation an important factor in a game?
3. What features do you like/look for in a gaming animation?
4. What do you think about the statement, “an animation is a kind of virtual reality”?

For the main theme Metaverse the questions were:

1. What is the Metaverse for you? Refer to at least three words about what it means.
2. What do you think about the Metaverse? What do you think the Metaverse is for?
3. Have you ever been immersed in the Metaverse? What made you feel/think?
4. For which population do you think the Metaverse is more directed? (Adults, Teens, Children, or Seniors/Elderly?)
5. How is the Metaverse present in your daily life?
6. Do you think the Metaverse is a virtual reality? Why?
7. How do you think/feel about the Metaverse's relation to our social reality?
8. What do you think about the possibility of social reality being an important factor in interacting with the Metaverse?
9. Is a game a Metaverse?

3.2. Data Gathering and Analysis

In each online focus group, the participants were informed before the discussion that their participation was voluntary, confidential, and anonymous, and they could decide to leave anytime. We also obtained a verbal agreement from the participants to allow the recording of the online focus group session for posterior data analysis.

During the focus group there were many participants answered the questions with only one or two words or small sentences, which allow us to categorize in a frequency results.

All the qualitative data gathered was transcript to a Word file, summarized and categorized (e.g., fun and enjoy fun – joint categorization Fun) the concepts mentioned, and analyzed by the frequencies of responses from the participants, considering categories and main themes. After this categorization, we calculated the frequencies and percentages of the answers given.

3.3. Data Results

For the Gaming questions:

1. What is it for you to play?

Table 1. Gaming - What is it for you to play?

Categories	Total	%
Fun	13	100
Escape reality	6	46.2
Relax	6	46.2
Socialization	5	38.5
Hobbie	3	23.1
Therapy	1	7.7

As we can observe (see Table 1), according to the meaning of playing, all the participants considered it fun (N=13, 100%). Some participants felt something that allowed an escape from reality and a relaxing activity (N=6, 46.2%). This gives us essential concepts such as good mood and new game experiences, reinforcing gaming as something that promotes the well-being of the players.

2. What is the gaming world for you?

Table 2. Gaming – What is the gaming world for you?

Categories	Total	%
Community	7	53.8
The specific group enjoys games	6	46.2
Digital Games	4	30.8
Games categories	3	23.1
Specific group	2	15.4
Join of concepts	2	15.4
Games Industry	2	15.4
Society stereotype	1	7.7
Culture	1	7.7

Table 2 shows that the gaming world is considered something that gathers people, such as a community (53.8%) and that enjoy games (46.2%). These results show us that the players consider the gaming world as a social and well-being world.

3. What is a gamer for you?

Table 3. Gaming - What is a gamer for you?

Categories	Total	%
A person that plays games	8	61.5
The name given to a group of people	6	46.2
A person that likes any games	5	38.5
A person that regularly plays games	2	15.4
A person that plays games has hobbies	1	7.7
The person who likes computers	1	7.7
A person who likes technology	1	7.7
Synonym of Nerd expression	1	7.7

Most participants responded that a gamer plays games (61.5%) and that gamer is a word used to classify a group of people (46.2%). So we can observe that for these participants, a gamer can be anyone playing games, giving a generic or simple consideration regarding a common synonym of a gamer without pre-concepts.

4. What do you think about there being different types of gamers?

Table 4. Gaming - What do you think about there being different types of gamers?

Categories	Total	%
Yes	13	100
No	0	0

Table 5. Gaming - What do you think about there being different types of gamers?

Categories	Total	%
Frequent ou daily gamer	11	84.6
Occasional gamer	11	84.6
Professional gamer	6	46.2
Semi-professional	1	7.7

On this question, we can see that the participants were unanimous, considering that there are different types of gamers (100%), meaning that they play frequently or occasionally (84.6%). They also considered this question the premise of the professional gamer (46.2%). These show us that from common perception, a gamer is characterized by their playing frequency.

5. How do you feel/think that the gaming world is present in our daily lives?

Table 6. Gaming - How do you feel/think that the gaming world is present in our daily lives?

Categories	Total	%
Yes	13	100
No	0	0

Table 7. Gaming - How do you feel/think that the gaming world is present in our daily lives?

Categories	Total	%
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Provides fun	7	53.8
Relaxation	4	30.8
Socialization	4	30.8
Provides positive emotions (happiness, cheerfulness)	3	23.1
Part of the personality of a person	2	15.4
Escape reality	1	7.7
Necessity to play	1	7.7

For the participants, the gaming world is present in their daily lives (N=13, 100%, table 6) because it is mainly a source that provides fun (N=7, 53.8%). These results are expected since all these participants are considered gamers, but most of these results show us the need for fun, relaxation, and socialization in a gamer's life.

6. What do you think/feel about the statement "a game is a virtual reality"?

Table 8. Gaming - What do you think/feel about the statement "a game is a virtual reality"?

Categories	Total	%
Yes	10	76.9
No	3	23.1

Table 9. Gaming - What do you think/feel about the statement "a game is a virtual reality"?

Categories	Total	%
Creates an alternative reality	3	23.1
Virtual reality does not apply to games	1	7.7
This applies to augmented reality	1	7.7
Reality provided by computers	1	7.7
Provides experiences	1	7.7

For this question, we can see that most participants consider a game as a promotor of virtual reality (N=10, 76.9%, table 8) because it can create an alternative reality (N=3, 23.1%, table 9). Through these results, we can understand that most gamers understand the meaning of the virtual reality concept and observe some confusion or no awareness regarding this.

7. What do you think/feel about the possibility of social reality being an important factor in choosing a game in favor of others?

Table 10. Gaming - What do you think/feel about the possibility of social reality being an important factor in choosing a game in favor of others?

Categories	Total	%
Yes	12	92.3
No	1	7.7

Table 11. Gaming - What do you think/feel about the possibility of social reality being an important factor in choosing a game in favor of others?

Categories	Total	%
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Friends and close people playing the same game	12	92.3
Social component	10	76.9
Unites people	5	38.5
Friends reference	4	30.8
Gameplay of the game	2	15.4
Games classification (magazines or tv shows)	2	15.4
Price	1	7.7

In this question, the social reality of a game was considered almost unanimous as something important when these participants consider a game (N=12, 92.3%, table 11), mainly because friends and close people play the same game (N=12, 92.3%, table 11) and because the game itself has a social component (ex: chat, community, blog, multi-player) (N=10, 76.9%, table 11). Social connection is essential when choosing the game type to reinforce, be around friends, or make new connections.

8. When you play, do you feel immersed ("inside") in the game?

Table 12. Gaming - When you play, do you feel immersed ("inside") in the game?

Categories	Total	%
Yes	12	92.3
Sometimes	6	46.2
No	1	7.7

Table 13. Gaming - When you play, do you feel immersed ("inside") in the game?

Categories	Total	%
It depends on the game type	6	46.2
Identification with the game characters	5	38.5
Game history	4	30.8
It depends on the game context	1	7.7

According to this question, we can understand that almost all the participants feel immersed in a game (N=12, 92.3%, table 12). However, they also answered that it could be only sometimes (N=6, 46.2%, table 12), mainly because they considered that it depends on the type of the game (N=6, 46.2%, table 13). So we can consider that although all the games provide an immersed feeling, this immersion feeling can be stronger or weaker depending on the type of game. Nevertheless, all the games offer immersion feelings.

9. How do you relate playing with your everyday reality?

Table 14. Gaming - How do you relate playing with your everyday reality?

Categories	Total	%
Provides fun	7	53.8
Relaxation	4	30.8
Socialization	4	30.8
Provides positive emotions (happiness, cheerfulness)	3	23.1
Part of the personality of a person	2	15.4

Escape reality	1	7.7
Necessity to play	1	7.7

As we already saw in the questions above, the playing action is considered by most participants playing games as something that provides fun (N=7, 53.8%, table 14). Fun is considered as an essential theme in the life of a gamer.

10. How do you relate playing with Animation and the Metaverse?

Table 15. Gaming - How do you relate playing with Animation and the Metaverse?

Categories	Total	%
Concepts are connected	13	100
Important concept	9	69.2

With this question, in Table 15, we can see that concepts such as Metaverse and Animation are considered connected (N=13, 100%) and important (N=9, 69.2%) in the gaming world. We can see a conscient understanding of Gaming, Animation, and Metaverse concepts and their relation.

11. To what extent do you feel immersed in a virtual world while playing the game? As? Why?

Table 16. Gaming - While playing the game, to what extent do you feel immersed in a virtual world? As? Why?

Categories	Total	%
History	7	53.8
Build/create things	6	46.2
Gameplay	6	46.2
Fun	5	38.5
Price	5	38.5
Person's state of mind	4	30.8
Visual graphics	4	30.8
Socialization	3	23.1
Emotions (ability to create)	2	15.4
Characters	2	15.4
Music/Audios	2	15.4
Community	2	15.4
Curiosity	1	7.7
Immersive	1	7.7

The participants on this question, table 16, showed us that the history (N=7, 53.8%), the possibility to create/build things (N=6, 46.2%), and the gameplay (N=6, 46.2%) has the main characteristic of them to feel more immerse on the virtual world given by the game. We can observe that the attributes mention for immersion are engaging and fun promoters.

12. What are the most fascinating features for you to play?

Table 17. Gaming - What are the most fascinating features for you to play?

Categories	Total	%
History	7	53.8
Build/create things	6	46.2
Gameplay	6	46.2
Fun	5	38.5
Price	5	38.5
Person's state of mind	4	30.8
Visual graphics	4	30.8
Socialization	3	23.1
Emotions (ability to create)	2	15.4
Characters	2	15.4
Music/Audios	2	15.4
Community	2	15.4
Curiosity	1	7.7
Immersive	1	7.7

The same characteristic, table 17, has the above question we can see when the participants relate to the most liked features of a game to play, history (N=7, 53.8%), the possibility to create/build things (N=6, 46.2%) and the gameplay (N=6, 46.2%). We can also understand that a gamer seeks a game's engagement and fun promotion.

13. What are the most important features in a game to feel more immersed?

Table 18. Gaming - What are the most important features in a game to feel more immersed?

Categories	Total	%
History	6	46.2
Gameplay	6	46.2
Characters	5	38.5
Build/create things	5	38.5
Visual graphics	5	38.5
Socialization	4	30.8
Music/Audios	4	30.8
Price	4	30.8
Emotions	2	15.4
Fun	2	15.4
Curiosity	1	7.7
Person's state of mind	1	7.7

As for the important feature of feeling more immersed in a game, we can see the history and gameplay (N=6, 46.2%), characters, ability to build/create things, and visual graphics (N=5, 38.5%). Once again, engagement and fun-promoting features are the most important for immersion.

14. Do you know or use any objects/technologies that provide immersion in a game? 506
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Table 19. Gaming - Do you know or use any objects/technologies that provide immersion in a game? 508

Categories	Total	%
Headphones	9	69.2
Keyboard	5	38.5
VR goggles	4	30.8
Monitors	4	30.8
Chair	3	23.1
Interactive game commands	1	7.7
Computer Software that controls the environment	1	7.7
Mousepads	1	7.7

Most participants considered the headphones the leading provider as a technology object of immersion in a game (N=9, 69.2%, table 19). These results show us that headphones as a significant technology that emphasizes the sense of immersion. Compared with other technologies, these results make us wonder if the simple or cheaper technologies already have tremendous power to provide this immersion feeling. Expensive technology is not available for everybody, but it does not mean they are less immersion feeling providers than cheaper ones. 509
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For the Animation questions: 517

1. What do you think/feel about the statement “animation is present in all games”? 518
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Table 20. Animation - What do you think/feel about the statement “animation is present in all games”? 521
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Categories	Total	%
Yes	11	84.6
No	2	15.4

Table 21. Animation - What do you think/feel about the statement “animation is present in all games”? 523
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Categories	Total	%
Has to be mandatorily present	7	63.6
Makes characters more real	2	18.2

In this question, we can see that for most participants, the animation is present in all games (N=11, 84.6%, table 20) and is mandatory to be present (N=7, 63.6%, table 21). The results show us that the definition of what is animation and its importance are current in the gamer’s mind. 525
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2. Do you consider Animation an important factor in a game? 529

Table 22. Animation - Do you consider Animation an important factor in a game? 530

Categories	Total	%
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Yes	13	100
No	0	0

Table 23. Animation - Do you consider Animation an important factor in a game?

Categories	Total	%
It has to be adapted to the gameplay of a game	5	38.5
Graphics can influence the desire to play	3	23.1
It has to be adapted to the game	3	23.1
Can determine a game's success	1	7.7

According to this question, all participants considered animation an important game factor (N=13, 100%, table 22). Some of the participants revealed their thoughts about animation being adapted to the gameplay of each game (N=5, 38.5%, table 23). It's clear that the animation is part of a game; without it, there would be no games.

3. What features do you like/look for in a gaming animation?

Table 24. Animation - What features do you like/look for in a gaming animation?

Categories	Total	%
Style/aesthetics	6	46.2
It has to be adapted to the game	5	38.5
Gameplay	5	38.5
Socialization	1	7.7

The main feature that the participants look for in a gaming animation is style/aesthetics (N=6, 46.2%, table 24). Animation is something that has to be well thought about in its style and aesthetics.

4. What do you think about the statement, "an animation is a kind of virtual reality"?

Table 25. Animation - What do you think about the statement, "an animation is a kind of virtual reality"?

Categories	Total	%
Yes	6	46.2
No	7	53.8

Table 26. Animation - What do you think about the statement, "an animation is a kind of virtual reality"?

Categories	Total	%
It is part of but not one	3	50
Creates virtual reality	3	50

On this question, is animation a kind of virtual reality, we can see a clear division (table 25) between Yes (N=6, 46.2%) and No (N=7, 53.8%). However, if we see the answers given by the participants that responded yes, that animation is seen as something that creates/part (N=3, 50%) of the virtual reality as a mean. These results show an inevitable

confusion or no awareness of the definition or relation between animation and virtual reality concepts. 551
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For the Metaverse questions: 553

1. What is the Metaverse for you? Refer to at least three words about what it means. 554
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Table 27. Metaverse - What is the Metaverse for you? Refer to at least three words about what it means. 556
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Categories	Total	%
Past	13	100
Socialization	9	69.2
Evolution	9	69.2
Virtual	7	53.8
Creation	6	46.2
Immersion	3	23.1
Build	3	23.1
Monitorization	2	15.4
Threat	1	7.7
Risk	1	7.7
Innovation	1	7.7

In this question, table 27, the participants reveal that for them Metaverse concept is something from the past, is not a new concept (N=13, 100%), is viewed as socialization and evolution means (N=9, 69.2%), and something virtual (N=7, 53.8%). There is an awareness of the development and history of the Metaverse concept and the importance of the socialization and virtual reality themes as features/characteristics that need to be present. 558
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2. What do you think about the Metaverse? What do you think the Metaverse is for? 566
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Table 28. Metaverse - What do you think about the Metaverse? What do you think the Metaverse is for? 568
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Categories	Total	%
Old concept	13	100
Promotes Socialization	9	69.2
Technological evolution	9	69.2
Virtual reality	7	53.8
Creates characters	4	30.8
Allows immersion	3	23.1
Allows people to make things virtually	3	23.1
Monitorization of the virtual world	2	15.4
Creates a new reality	2	15.4
Creates new worlds	1	7.7

As for this question, the Metaverse is seen as an old concept (N=13, 100%), as already been among us, promotes socialization and technological evolution (N=9, 69.2%), and it also supports virtual reality (N=7, 53.8%). The Metaverse concept its seen has a socialization promoter through virtual reality technology.

3. Have you ever been immersed in the Metaverse? What made you feel/think?

Table 29. Metaverse - Have you ever been immersed in the Metaverse?

Categories	Total	%
Yes	3	23.1
No	10	76.9

Table 30. Metaverse - What made you feel/think?

Categories	Total	%
More fun	3	100
More immersion	2	66.7

Almost all participants have never been immersed in the Metaverse (N=10, 76.9%, table 29). As for the participants that have been immersed in fun (N=3, 100%) and the feeling of been even more immersed in the game (N=2, 66.7%), where the main thoughts they had about their experience. This can lead us to the awareness about the Metaverse definition or even how it can be experienced. It's unclear or generates a sense of confusion.

4. For which population do you think the Metaverse is more directed? (Adults, Teens, Children, or Seniors/Elderly?)

Table 31. Metaverse - For which population do you think the Metaverse is more directed? (Adults, Teens, Children, or Seniors/Elderly?)

Categories	Total	%
Adults	9	69.2
Adolescent	9	69.2
N/A	5	38.5
Children	4	30.8

In this question, we tried to understand the main population n for which the Metaverse was aiming, table 31, and we could see that the participants did not have a clear response, and even a N/A was mentioned. Nevertheless, of the confusion, adults and adolescents were the main population referred (N=9, 69.2%). At this point, there is significant confusion about the Metaverse concept, even on the population that is aiming.

5. How is the Metaverse present in your daily life?

Table 32. Metaverse - How is the Metaverse present in your daily life?

Categories	Total	%
Yes	8	61.5
No	5	38.5

In this question, we could see that most participants responded that this concept is present in their daily lives (N=8, 61.5%, table 32). Once again, we can see confusion or no awareness about the Metaverse compared with the previous question. However, we can see that the participants are consciously or unconsciously aware of their presence in their daily lives.

6. Do you think the Metaverse is a virtual reality? Why?

Table 33. Animation - Metaverse - Do you think the Metaverse is a virtual reality?

Categories	Total	%
Yes	13	100
No	0	0

Table 34. Metaverse - Why?

Categories	Total	%
Creates virtual worlds	5	38.5

For this question, we saw the unanimous response of the Metaverse being a virtual reality, table 33, and some even added that this concept is the creator of virtual worlds, so it is responsible for virtual reality. It's transparent for these participants that virtual reality is a central component of the Metaverse concept.

7. What do you think/feel about how the Metaverse relates to our social reality?

Table 35. Metaverse - What do you think/feel about how the Metaverse relates to our social reality?

Categories	Total	%
Yes	9	69.2
No	6	46.2

Table 36. Metaverse - What do you think/feel about how the Metaverse relates to our social reality?

Categories	Total	%
Social tool	10	76.9
Not a direct impact	1	7.7

When understanding if the Metaverse is related to our social reality, most participants answered yes (N=9, 69.2%, table 35), explaining that they considered it a social tool (N=10, 76.9%, table 36). The Metaverse concept is understood as a social tool that promotes socialization.

8. What do you think about the possibility of social reality being an important factor in interacting with the Metaverse?

Table 37. Metaverse - What do you think about the possibility of social reality being an important factor in interacting with the Metaverse?

Categories	Total	%
Yes	9	69.2
No	6	46.2

As for this question, in Table 37, we see that social reality is essential when considering the interaction with the Metaverse (N=9, 69.2%). We can see the importance of socialization in the Metaverse concept.

9. Is a game a Metaverse?

Table 38. Metaverse - Is a game a Metaverse?

Categories	Total	%
Yes	9	69.2
No	4	30.8

As for this question, most participants see the Metaverse as a game (N=9, 69.2%, table 38). The Metaverse concept is seen as a game, and these results clearly show us the relation between this concept and the technology evolution through the gaming world.

4. Discussion

Our findings gave us actual results regarding the Metaverse virtual reality and gaming concepts and the relation between these three concepts, contributing to understanding how gamers perceive and represent the Metaverse.

Our findings allow us to identify: how the Metaverse is being represented and characterized, which technologies stimulate the immersion experience, and the main dimensions that influence the acceptance of the Metaverse concept. We also understood the perceptions of the relationship between the Metaverse and virtual reality regarding socialization and well-being and the relationship between these concepts and gaming in a gamer's life. Finally, we determined the social representations of gaming.

Regarding our first objective, how the Metaverse is being represented and characterized, we found that this concept is not new for the gamer's perceptions. Technological evolution has developed it, and it is portrayed as a social tool and a virtual reality promoter. It was also possible to understand confusion or lack of knowledge regarding the definition of the Metaverse. However, central concepts such as virtual reality and gaming relations were identified, showing the awareness of their association with this concept.

These results are according to the concept's definition and categorizations since it unites socially immersive virtual realities with video games [16] and will transform social networks [35]. It's also considered an environment that merges physical and digital reality [36], and it can promote digital engagement, mixings gaming, social networking, and virtual reality [37].

According to the results and our second objective, the technologies that stimulate the immersion experience may vary. Still, the gamer's perception shows us that a simple headphone can be crucial for immersion. It's also possible to see awareness of the technology as a keyboard, VR googles, or a monitor that leads to the understanding that the price or more evolved technology does not mean immersion. This leads us to the knowledge that the Metaverse is available through different devices [37] with other characteristics.

Third, the main dimensions influencing the acceptance of the Metaverse are the gaming world and virtual reality. And there's no surprise because the Metaverse relies on a digital universe that mixes online gaming [34] or other gaming worlds [33]. Well-being, such as fun and relaxation, are precise dimensions that allow gamers to accept this concept. In a previous study, it was verified the perceived pleasure is a relevant concept for accepting the Metaverse [6].

These also lead to the fourth objective, understanding the perception of the Metaverse and virtual reality regarding socialization and well-being. Our results show

this by the participants when they refer to the Metaverse as a socialization concept and socialization promoter (Table 27 and 28) and by clearly stating that the Metaverse creates more fun (Table 30), therefore, a supporter of well-being. In terms of the association of the Metaverse and virtual reality, the participants stand out by affirming that Metaverse is a virtual reality, which states a confusion or lack of knowledge regarding each concept definition, but most important, they made the two concepts as one and so they see these concepts as promoters of socialization and well-being.

Regarding the perceptions of a gamer's daily live regarding the Metaverse, virtual reality, and gaming concepts, it was demonstrated that the daily lives of gamers are continuing to be impacted by the Metaverse, virtual reality through the gaming world, because of their predisposition to accept digital transformation into their lives [4].

Looking at objective six, understanding the impact of representation on the gaming concept, the gamers have mentioned social representation regarding the Metaverse, virtual reality, and the gaming world with no exception. They all promote individual or combined social communication. In the gaming world, because players enjoy playing with others [14], most video games are played with others [13] and allow bonding [15].

As for our last objective, to understand the perceived role of animation regarding the Metaverse, virtual reality, and gaming concepts, we can see their uniqueness and strait relation. Animation, which allows a game to be possible, brings us portals between fantasy and reality, and reality and the social [61]. Animation and its colossal power to transform reality [6] joins virtual reality, providing the participant's experiences and an immersion environment in different forms [32]. In this sense, the gaming world has become the concept that allows the Metaverse to emerge.

With our findings is understood that the Metaverse concept is still to create its own boundaries or complete definitions. However, we can see that this concept relies on virtual reality, and games continue this evolution. This concept is characterized as a promoter of well-being, fun, relaxation, and socialization that can be achieved with more immersive experiences provided by technology or gaming characteristics.

In the near future, we consider it essential to continue exploring these concepts' relations and definitions using other methodologies, such as quantitative methods – developing case studies with different types of users/gamers (as long as the Metaverse and Metaworlds are more widespread in several contexts and daily practices).

5. Research Limitations

The number of focus group interviews made – more focus groups realize more the data obtained could be considered significant. The fact that it was an online focus groups discussions could have reduced the non-verbal communication. However, in our study, we used software to record the video of the interviews, and all the participants were asked to use their cameras – after signing an informed consent, agreeing to participate in the study.

Another limitation could be the large or few number of questions depending on the perspective taken. Many questions become more exhaustive for the participants and, therefore, a lack of participation because of the time it takes. Fewer questions can probably promote better participation, but they may not cover all the themes. According to the participant's discussion, it also gives us more time for others that may arise. Nevertheless, the questions previously accorded are not the only ones that can be made depending on the discussion, further questions can arise.

It is also important to mention that this study only has Portuguese gamers, and the findings could differ (or not) with a diverse population or nationality.

Finally, we have to refer to the knowledge, lack, or confusion regarding the definition of the concepts by the participants, which may vary according to other participants.

5. Conclusions

Since 1992, when Neal Stephenson proposed this concept, the Metaverse has been gaining a space and relevance in our reality. It is something that, for some, is considered an old concept, perhaps because of its history or dependence on existing concepts such as gaming and virtual reality, and for others is considered something new, perhaps by the novelty or greater attention that authors or companies have given.

This concept has gained awareness even by the possible users or active users. However, it lacks an agreed definition by authors or even lacks boundaries since it is still evolving. This creates confusion between what is the Metaverse and what is not, by their users. Our findings demonstrated this vulnerability of the concept.

This exploratory study is of great importance because it allows us to access the perceptions of Portuguese gamers about this concept, showing that confusion and lack of boundaries percept exist between them. It's also important because, in the scientific world, a lot has been said regarding the Metaverse concept. However, there is a lack of investigations focusing on what common persons understand regarding this concept. It's also important because it can give the gaming and technology industry and scientific studies more knowledge about tendencies according to the common knowledge that will lead to how these concepts will evolve. After all, all these concepts evolve according to the needs and likes of the people.

Focusing on our research question, "How is the Metaverse being percept and represented by gamers?", we verify that they represent it as something technological and social promoting, achieved by games through virtual reality experiences.

We can write a possible definition for this concept based on the participant's answers: The Metaverse concept has been around for a long time because it's considered a game that allows immersive experiences through virtual reality technology, and the style and aesthetics of the animation provided. It's also an essential means of socialization and communication, at an individual level with its representations or a community level with general terms. It's also an essential promoter of the well-being of its users.

The Metaverse still has much to be explored. Still, it already showed us the power of new means of communication through social networks, becoming a social realm where the power of communication is exercised, implemented, and has no limits. The only limit is the human ability to dream or to create things. So this concept is also making its path as a social media mean, becoming a form of mass self-communication [1].

Looking at the initial idea from Neal Stephenson (1992) till the present, we can see a clear evolution from a conceptual picture to a more eligible or tangible concept. It has gained some definition and importance on fields such as virtual reality and gaming, as well as being considered a new means of communication. Nevertheless, it still has a lot of objective boundaries and limits to explore.

Perhaps the Metaverse will be something like the OASIS world in the Ready Player One movie in 2018, where we can be whatever we want, experience different realities in pursuing something different, fantastic, or a dream, hoping to be immersed in these new realms for some time believing that reality as a real thing.

Supplementary Materials: The following supporting information can be downloaded at: www.mdpi.com/xxx/s1, Figure S1: title; Table S1: title; Video S1: title.

Author Contributions: Conceptualization, M.C. and A.O.; methodology, M.C., and A.O.; validation, A.O.; investigation M.C.; resources, M.C.; data curation, M.C.; writing—original draft preparation, M.C., and A.O.; writing—review and editing, M.C. and A.O. and supervision A.O. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

Acknowledgments: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

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