The Use of Worldbuilding as a Meditative Tool with Narrative Through Visual Storytelling

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THE USE OF WORLDBUILDING AS A MEDITATIVE TOOL THROUGH A VISUAL NARRATIVE EXPERIENCE

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Abstract—In media, worldbuilding is often the driver of immersion. One of the main reasons is the life and plausibility it gives its world. From the epic novels of J.J.R. From Tolkien to hundreds of blockbusters, worldbuilding has always been an essential creative element in fiction. But is it a beneficial tool for treating mental health through its replicated virtual environments? In this article, we will discuss the scope and uses of worldbuilding, the many natural elements present therein, and the potential of virtual reality (VR) technology as a way to bring the experimental game to life. Finally, we will evaluate those virtual, peaceful environments that include worldbuilding and immersive elements for benefits to mental health. We will use questionnaires describing the game flow and player experience to help analyze and answer the hypothesis.

Em media, o "Worldbuilding" costuma ser o motor de imersão. Um dos maiores motivos é a vida e credibilidade que traz ao seu mundo. Dos romances épicos de J.J.R. Tolkien a centenas de filmes Blockbuster, a worldbuiding sempre foi um elemento criativo muito importante em ficção. Mas será que pode ser uma ferramenta benéfical para a saúde mental por replica ambientes virtuais? Neste artigo, nós vamos discutir sobre o ambito e utilidade de Wordlbuilding, dos muitos elementos da natureza e o potencial das tecnologias de Realidade Virtual (VR) como método de dar vida ao jogo nesta experiência. Nós vamos avaliar esses ambientes calmos virtuais que incluem "Worldbuilding" e elementos imersivos para beneficiar saude mental. Nós vamos avaliar esses ambientes calmos virtuais que incluem "Worldbuilding" e elementos imersivos para beneficiar saude mental, respondendo as conceitos.

Index Terms—Worldbuilding, Meditation, Virtual Reality, Realism, Senses

I. INTRODUCTION

In most fictional media, there are a lot of elements that are needed to make a complete experience. The narrative in most of these media defines the tone, style, and which public it attracts the most, as it is just as captivating as an expressive conversation about a subject of interest in all sides [1]. Thanks to its involvement in media, many messages, themes, and beliefs have formed the minds of consumers worldwide ever since the Egyptian times with their mythology [2]. This is

because narration has many elements within it that subtly raise our senses to be emotionally involved with it as it raises or lowers its conflict escalation bar [3].

One of these elements is the structure of Worldbuilding, which, while not a distinct element in the narrative, is potentially one of the more captivating elements in its story [4]. It is used to bring life to the stories told in whichever way to bring believability, context, and immersion to the greater ordeal that the narrative focuses on. Not only it is a major part of it, but it can bring the tone of the story through the way the narrator interprets it.

One example in literature is "The Perfume" by Patrick Süskind [5]. In it, a serial killer from France before the Revolution with a powerful and controlled nose in search of the ultimate smell of his perfume. While the story is already really well made, it doubles in its virtues with its descriptive writing, mentioning in few words the intense smell of the world around him to such a degree, that it instinctively gives the reader the smell of his world. Its impactful style was followed in the movie adaptation in 2006, though strangely not as captivating even with all the advantages [6]. That is likely because the world of the book is described in tone from the smell which the main character captures, so getting only his opinion of his world as opposed to also seeing it leaves a more defining impression of it, both in a social and make-believe manner, respectively [5], [6].

Another example of recreating the world from a different media comes when the writing work of Edgar Allan Poe [7] was utilized as the basis for the debut album of Alan Parsons Project [7], "Tales of Mystery and Imagination", in which the musicians recite some of the writings of the author. Two of these are explained in detail in this article how [7] their music replicates their dream-like tone, recreating the suspenseful, dreamlike songs fitting to its source material [7].

These are just some examples that show the unique and effective ways a story can represent the point they want to bring with the use of Worldbuilding, which makes me wonder if the way it is studied can be effective in other areas. For many centuries, mankind has created means to ease the

mind. From Chinese martial arts used to ease the tension and blood pressure within the body and mind [8] to creating environments that contrast the noise of the workplace like the beaches [9], we need to take our time off work now and then. Unfortunately, not everyone can have the fortune to live close to a place of comfort or cannot take some time off and have to finish a project earlier, they may have some fear or physical injury that prevents them from finding the place of comfort [10]. For one reason or another, people need alternatives to let them be able to calm down.

II. Worldbuilding in media

Worldbuilding is an important part of narrative structure [3]. While the main goal of most narratives is to show the development of characters, their goals, how they respond to challenges, and whether they manage to overcome them, it is the world in which they develop as characters that makes these adventures all the more captivating [4]. The world around the characters in the story essentially ensures the believability of the story [4]. This is important so that the moral or concept the story provides becomes more accepting and understandable.

The best way to explain the structure of worlduilding and its importance in a narrative is to show examples used in the media [4].

A. The definition of Worldbuilding

Worldbuilding is a narrative device that allows an author to describe the world in which characters live. This refers not only to the geography they encounter or have been in but also to the details of the wider region and world narrated by the characters or narrators [4]. One example is Middle-earth in the Lord of the Rings books by J.J.R. Tolkien [4]. It detailed not only the current state of the world, its inhabitants, houses, objects, and culture but also the past and possible futures of these elements [4]. This is necessary to make the story more believable, not if it is realistic, but that these fantastic species, places, and customs require relevant skills, struggles, and interests to hold the interest of the reader [11]. This is similar to how people like to travel to learn about different cultures and lifestyles in real life and invest in them because of the human element involved [12].

Across all narrative elements, worldbuilding continually works to bring the story to life within the context of the main conflict [3]. Although there are many examples of defining narrative structure [13], seven elements are consistently present in most studies: plot, setting, characters, point of view, style, themes, and conflict [14]. While not all of these are necessary to create a successful fictional world, using as many of them as possible will promote immersion in that world, thereby providing useful elements for analyzing the structure of worldbuilding [3].

There are also ways to keep consumers engaged with unfinished worldbuilding storylines. One of the most famous examples is the way Charles Dickens ended his continuous stories with an unfinished scene, usually with high stakes [15]. This means that the fictional world and its narrative have been created so immersively that the consumer needs to know what will happen, and therefore wants to buy the next piece of media [15]. This method has not only been shown by writers but also in most media, notably with television series aimed at a younger audience, with usual success [16].

There are also ways to instigate consumer loyalty towards the unfinished plotlines within worldbuilding. One of the more famous examples is the way that Charles Dickens famously finished his continuous narratives with a cliffhanger, which means that the narration of the story ended with an unfinished scene, usually of high stakes [15]. This means that the fictional world and its narrative were made in such a compelling way, that the consumer becomes invested and in need of knowing what happens next, thus wanting to purchase the following piece of media [15]. This method has not only been proven to work by other authors but it has been consistently used throughout media, most notoriously with TV series aimed at younger audiences with usual success [16]. The narrative can also switch between time frames to remind consumers of old plot points or to retroactively add new plot points into the backstory [17]. This can also serve as a nod to future storylines to add focus to the current narrative moment. These techniques show that this fictional world is continuous and therefore more immersive [17]. All of the elements described so far demonstrate how to effectively combine narrative with worldbuilding to enhance the consumer experience [16].

B. Ways media has shown its worldbuilding

Although media can be creative in the way it shows its world, it is usually done through direct narration by the author. This is particularly illustrated by the way cinematography works in movies, namely the use of light, color, focus, position, movement, and contrast [18].

One of the first examples that come to mind is the dystopian cyberpunk future displayed within the world of "Blade Runner", a duology film made by Ridley Scott, based on the novel "Do Androids Dream of Electric Sheep?" by Philip Kindred Dick [19]. In it, the protagonist is tasked to hunt down and exterminate humanoid escapees that arrived from colonies outside of Earth called replicants, which are barely distinguishable from human beings to the point of showing the same emotional complexity [20]. While the plot is as straightforward as this, the movie shows the world that justifies the existence of these advanced machines, where the wealth balance between the poor and the rich is exaggerated compared to real-life standards, though surprisingly similar. In the book "Blade Runner Experience" by Will Brooker, he talks about comparisons to New York as the basis for the imagery and issues of the city in the film. It rains constantly in the surrounding area and the sky is completely gloomy due to the tone of ecocide warfare and extreme capitalism. The light is mostly provided by the dim lights of shops, hotels, restaurants, or advertisements for luxury goods that the crowds that linger on these streets can only dream of [19], [21]. The harsh and dangerous tone of these streets is well depicted outside of the dialogue of the characters,

with pitch-black darkness surrounding colorful but somehow lifeless light sources. By contrast, when the characters enter a grand building, especially the one owned by he who is responsible for manufacturing and mass-producing replicas, which is light-filled and styled like the big cities of New York and Hong Kong [18]. Only when the protagonist ends his contract and successfully escapes the city with his replicant does the film reveal a clear, sunny sky beyond this dystopian nightmare. These visual elements expand the world in which the story takes place while justifying the story without directly stating it, a staple which is consistent as well with video games [22].

1) Horror narratives: One of the narrative genres that rely most heavily on narrative and worldbuilding is the all-out horror genre [23]. Due to the low average budget, it is often seen as a way to make money quickly through entertainment media. But when done right, horror films can captivate audiences like no other, as the recent film Talk to Me proved [24]. The Exorcist is one of the most famous examples of a well-written script and narrative interpretation. The theatrical debut was famous for the depth of its effect on its audience: some were sickened, some froze with fear, and many passed out by the end of the film or, in some cases, halfway through it and were forced to leave the theater [25]. Its legacy as "the scariest horror movie ever made" is evidenced by the realistic setting, scenes, and thought process that takes into account what the protagonists must deal with to save the possessed girl [25].

2) Psychological Horror: Many sub-genres within horror flesh out the author's interests and experiences with their unique tone, which is why they come in plenty of varieties [26]. Some classic examples are monster horror films, which focus on fictional creatures wreaking havoc, or gothic horror films, which have a specific architecture and aesthetic [26]Horror has gone through many changes throughout the history of entertainment media. One of the more specific reasons is the impact on the minds of the audience [27].

Within horror, there have been many subgenres that specify the interests and experiences of the authors in their peculiar tone, which is why there is a wide variety of them [26]. A few classic examples are monster horrors focusing on a fictional creature causing havoc or gothic horror with its specific architecture and esthetic, and then some genres are debated whether they are horror or not like war or dystopian movies [26]. Horror has had many iterations throughout the history of entertainment media. One of the more specific reasons for this is its play on the psychology of the viewers [27]. It is often very popular as a narrative device, especially in movies and video games, as its worldbuilding-building techniques constantly reflect the worldview of the audience in distorted and critical ways [27].

Videogames are just as capable of making as compelling of narratives as movies, and since it is the player who is forced into the existential twisting nightmares, it is usually the first media that comes to mind when people talk about psychology in horror like the lost souls haunting the living in the world

of Fatal Frame [28]. One of the best examples of horror using psychological elements in games is the Silent Hill series, more notably the Team Silent original series published by Konami [28]. In this series, the protagonists are forced into a hellish version of their inner insecurities and desires, represented through the level design which serves as a narrative and horror experience through worldbuilding [29]. The second game of the series, one of the most famous, stars James Sullivan, who is searching for his wife after he received an envelope from her, three years after she died from an incurable disease. In this town, there are other people with either impossible or non-existent goals, just like James [29]. Similarly to the town and the monsters within it, the inhabitants of this game have something that relates to the protagonist. Because everything is somehow related to the protagonist, it mostly is an indirect way to explain everything about what makes him such an emotionally problematic character, reflected on the molded, rusty, broken, vile, and inconsistent elements present throughout the town [29]. This is intensified as the player progressively clues in on the narrative and has to endure ever more disturbing music, which includes sounds of dentist drills, washing machines, and industrial equipment, alongside the increasingly disturbing visuals of the gameworld [28]. Elements like this with as impactful atmosphere can be found in some 2D games like Darkwood, but it usually isnt as immersive as of a 3D world. (darkwood reference) This may be a way for the characters to find a way to deal with their trauma as if the town is a sort of a psychologist [30].

If a proper narrative construct is effective in providing a stressful and scary feeling to a general audience, the same can happen the other way around with just the same effectiveness as the mentioned examples, though in a reverse way [31]. The article of Jodi L. Whitaker and Brad J. Bushman talks about how relaxing video games have the opposite effect compared to aggressive combat-focused video games. The players who partook in the relaxing games had more positive moods and were helpful in tasks they took part in after the gaming session [31]. Apart from helpfulness in other tasks, another article shows that a game designed to increase awareness of psychological trauma in players can improve their sense of security and instill hope. This shows that even a game like Silent Hill 2 can have a positive impact on facing trauma despite or due to the horror shown [32].

C. The impact

While the horror genre has used worldbuilding for a great psychological impact on its consumers, the opposite can also be accomplished in entertainment media through psychological relaxation [22]. One of the more popular modern examples is Legend of Zelda: Breath of the Wild [22]. In this game, the player goes through vast lands filled with all kinds of environments, cities, and dungeons to loot, recreate, save enprisoned species, and empower equipment to progress further, eventually reaching up to the villainous Calamity Ganon and defeating him before he finishes destroying the world after Hyrule [33]. The distinction of this game comes

from the creative liberty the player has to utilize the gathered equipment as the adventure progresses. defeating enemies, solving puzzles, and, exploring the world of the destroyed Hyrule will always be different depending on the methods the player chooses [33]. He can climb mountains, fly off them with a paraglider, run or ride a horse through the fields, use magical abilities to help work with physics puzzles and cook with what the player can find for health points and more abilities [33]. It brings many interesting perspectives on how to explore environments freshly and it incentivizes the player to explore and go through them as they choose how to, just like tourists love to travel, remembering places and creating stories of their own with the new places they go to [34]. Some games such as Super Mario Odyssey have similar levels of creativity and exploration, which have been proven to help with mental illnesses like depression [35].

Some studies show that narrative experiments may affect attention span and concentration skills [36], depending on the level of immersion in the media. It also has been proven to be a motivating tool to make people invested in the journey they embark on and thus give them an interest in the subject matter [37]. So the narrative world in general, thus worldbuilding, is an encaptivating tool that, while effective, should not be overused [36]. It can be an essential guiding tool to help people learn important things in life and subject matters, alongside being a motivational tool [37]. So we believe it is necessary to use it to help people who want to delve into an uncharted environment that they are uncertain of [34]. Especially as we grow older and technology becomes more common in our lives, we have more difficulties in accepting new things and moving away from the way we work or socialize, and it is more likely to happen if it is a common subject that has been mentioned in their lives [38]. Not to say their goals should be drafted, but there are things in life that need to be considered, like their mental health and how it can be replenished [35].

III. ELEMENTS FOR RELAXATION

The escapism that worldbuilding brings works just the same as the way why we travel [34]. To compensate for the work done, we like to go to emptier environments where we can take in all that's around us and appreciate the feelings within all our senses [39]. Going to the beach is a common practice because of the appealing looks and colors of its vastness, the rays of the sun hitting the sea, which makes such soothing sounds as it hits the sand and rocks [9], the seagulls singing and flying in the background alongside the people's presence adding into the dynamic flow of the environment is necessary for our senses to be rebuilt [40].

It is possible that because the people who are used to city environments do not think about the distinct elements within it and why they influence their mood in the day [10]. It is mostly affiliated with stressful scenarios like the way the traffic may or may not be moving, regardless of this the amount of noise the vehicles make by being driven and buzzing loudly, and all the gas which they do elevates this problem [10]. All this pressure within, knowingly or not, is brought into the workplace.

To replicate the qualities of natural habitats for a more immersive experience, it is necessary to understand what makes them alluring to people. [40].

This chapter will focus on the elements beyond the dynamic elements referenced within worldbuilding that are made more distinct in these peaceful environments, to understand what they are, what can they become, how they influence, and at the end how they round up together to make a space that channels people to their relaxing overtone [40].

1) Sound: There have been multiple ways and attempts to replicate these environments utilizing other senses besides sight, which is what we think is the only way we judge things, even if quickly [41]. To help replicate the feeling of the environment, countless devices were and are being made to both show the excitement of the moments and to feel the ambiance within them.

Ever since the 1940s the concept of immersive sound has been put to the eyes of the public, with "Fantasia" by Walt Disney, in which music sound would travel from the left, center to the right ear or vice versa [42]. Eventually, after the popularization of stereo sound, came the existence of surround sound, which is comparable to the former, but localized usually in a 360-degree angle from horizontal and vertical planes [43]. It is usually most noticeable with the use of headphones since they can replicate the surround sound made, just like the theater or the cinema [43].

Technology has reached such a level of distinct detail with sound that many specific points can be brought to attention besides easy distinction of the tone of them [44]. As expected, dynamic sound has become a possibility, which means being able to focus on a specific sound amongst multiple others or having a sound become quieter as attention to it ceases to become a possibility in any media [44]. Soundscape ecology is the composition of other sounds that complete the ambiance within environments, the addition of the sound of anthrophony, meaning from man-made items, Geophonic, which is nature-made sounds like the weather, biophonic sounds, from animals or people, and orchestral instrumentation [45]. Thanks to these technologies, communication with other people, for example with video chatting, makes the interaction feel much closer to if said person was present next to the other [46].

2) Ambience Music: While sound can be enough for some games to make the experience feel complete, regardless of the genre and piece of media of the topic, most often music is needed as an extra element to make the most out of the experience, like helping to study or just to calm down [47].

Every one of us even the animals in nature needs to make melodies as a way to entertain or bring attention, mostly as a way to communicate [48]. And even if we do not understand the sounds we hear within a forest, say, we appreciate the mixture of the sounds within it in a way that meditates us [48].

There are many examples of the use of sounds based on nature to turn otherwise cacophonical noises into more pleasant ones [39]. Qi gong and Tai Chi are physical exercise practices that heavily involve smell, space, and sound [49]. A

lot of it is oriental music with gongs and singing to help the listeners control their tempo within the exercises, which also are designed to test their focus on their movements and control their "chi", which is made as the person breathes calmly in a way that softens the body so the exercise creates a greater effect on the person [50]. There is also music that fits in this calm tone that is a mix of ambiance and literal sounds of nature like whale sounds deep in the ocean or sounds of currents [39], tambourines, and harmonic singing with piccolos alongside it. These latter sounds are what they usually use to make "zen" music, intended to make people relax after an intense exercise [49]. In this exercise, called Shavasana, the person lays down on a comfortable surface and loosens every part of the body, entering into such a calming state that it loosens muscular and organic tension [8]. The entire exercise routine is amplified and encouraged with the use of this very kind of focused music, added by the metaphorical and focused words spoken by the master in timed moments within the song [51]. These effects combined help those who are resting to stop focusing on their thoughts and instinctive worries, helped by focusing on the music and the words spoken by the master. For example, someone may have a digestive arrest from all the things they had to focus on in a day, and thanks to this exercise their stomach can function properly [52].

It does not have to be in a meditative exercise in which ambiance music resides in, in fact, it is in countless genres within music, to convey different emotions and tones [52]. Both the classical and popular genre utilizes multiple instruments and singers of different tones and kinds of sounds to help elevate the intensity or quantity of sounds, depending on their loudness [53]. This combination aids the echo effect which makes the music more pleasing, which is why so many people like to go to theaters or shows to listen to genres like these [53]. If not, the same technique used for watching movies at the cinema is used to similar effect, which is what other genres usually use to take advantage of the ambient effects, though a lot of times in the outdoors instead [53].

So sound and music are usually the earlier elements in relaxing environments which people take into consideration cause of the contrast of what they are used to in their city life [9]. However, its effect is far from the only one that revolves around the ambiance and beings that bring the totality of the feeling the locations bring. The weather and time of day have a lot of influence on how the effect should be made to correlate with the tone of the area, for example [9].

3) Time and Weather: In the realm of video games, time can be a significant narrative tool that can be utilized in numerous ways [54]. Certain events that occur can establish the tone for the rest of the game, like in Half-Life by Valve.Inc, where the player character, in which the player character, after installing an alien mineral into a machine, creates a portal that opens a rift between the base in which they reside and an alien invader dimension, leading to the ensuing disaster that sets the game's adventure in motion [54]. However, time is often consistent and follows a clock-like pattern, particularly in open-world games. The Grand Theft Auto series employs time

as an integral aspect of the gameplay, shortening the 24-hour cycle to accommodate the fast-paced gameplay. Nevertheless, the game's actions take as long as they would in real life. [54].

In multiplayer games, time does not usually work the way the examples above tell.

Each server has a finite number of rounds, which, upon completion, will automatically prompt the server to switch to a new map, thereby presenting fresh objectives for the players [55]. Although this generally means that each round and map has a time limit, there are times when the only way to end a round is by completing set objectives, such as in capture the flag maps, where players must retrieve an item from the enemy team and return it to their own base. This is known as Coordination Time [54]. Additionally, fictive time is a concept that labels time and events within a game universe, usually outside of gameplay, such as in menus. While it may or may not include a clock, it serves as a background element and has no impact on gameplay [54].

The weather can significantly impact the tone of a story, as demonstrated in the experiment of Oscar Rehnberg. Users preferred virtual environments with dynamic weather elements, such as rain, clouds, and wind, over static ones [56]. In addition, lighting effects, such as light rays, play a crucial role in creating realism and credibility in video games and movies. By bouncing light around the environment, the visuals of the scenery are enhanced and brought to life. [57]. Occasionally, it is a common practice to express what types of characteristics the protagonists of a given moment will embody, similar to how the beach is typically associated with summertime and its warmth [40].

IV. VIRTUAL REALITY

With the recent advancements in technology, it has become easier to create fabricated worlds that immerse users in a way that feels authentic, without the need for suspension of disbelief. Dynamic environments are more immersive than static ones [56]. and virtual reality (VR) technology has made it possible to replicate such tones with the use of tools such as surround sound [43], smell products [58], movement products for legs [59], hands and goggles that allow users to see the virtual world as if it were their own. This is the extent of the world of VR technologies [60]. In this regard, VR has brought forth new possibilities in creating virtual environments that have the potential to affect us in a manner similar to the elements of nature.The purpose of this chapter is to highlight the progress made in VR technology to determine if there is enough evidence to support its use as an immersion tool.

A. Extended Reality

It is important to consider the various technologies that are related to Virtual Reality (VR) before delving into its tools [61]. Extended Reality (XR) is an umbrella term that encompasses a collection of computer-generated technologies that simulate real-world environments and enable user interaction. This category includes VR, AR (Augmented Reality), and Mixed Reality (MX), which combines both VR and AR

[61]. AR enhances real-world environments through digital visual elements, sound, or other sensory stimuli, which can be delivered through technology. Such technology is commonly utilized in training environments, where real and virtual objects are combined, often within devices like Android and iPhone models [62]. Microsoft Hololens is an example of a tool that utilizes both AR and VR, enabling users to interact with virtual objects in the real world through hand and foot gestures. While VR and AR are often combined in various applications, VRChat is one of the most popular examples, where players from all around the world interact with each other in several maps,including closed areas like restaurants and open areas like hills [63].

B. VR Devices

VR has emerged as a popular commercial product, largely owing to its mass production and rapid technological advancements [64]. In addition to this, the technology has become more immersive with the introduction of accurate positional and eye tracking capabilities, surround sound 3D audio effects [43], and VR controllers that aid in more instinctive interactions within applications [64] and the Omni One VR Platform, which simulates movement through footwork, adding to the overall realism of the experience [59].

In regards to maneuverability within VR environments,while the VR headset is visually satisfying for users, the desire to interact with the virtual surroundings is inevitable. However, the smooth movement of the VR goggles does not align with the use of a traditional video game controller [64]. The HTC Vive offers glove controllers that can replicate the movement of both hands of the player within the virtual world [64]. This allows the user to utilize their fingers and hand position to interact with items, non-playable characters (NPCs), and the environment in a manner similar to real life [64]. Advancements in technology have led to the creation of the HaptX Gloves, which have the capacity to detect touch within VR. These gloves utilize air and pressure to contain hundreds of microfluidic actuators, referred to as inflatable balls, which displace within the skin of the hands to simulate touch from smaller objects. The device also restrains hand movement when the player is holding an item to simulate structure and allow for tilting, further immersing the user in the virtual environment [65].

In today's world, technology has advanced to the extent that smell can now be replicated within a virtual environment in Hong Kong. Although the technology is still at its nascent stage, products such as the ION, developed by OVR Technology, are capable of capturing thousands of smells within eight aroma cartridges. This technological breakthrough demonstrates how far we have come in simulating reality in a virtual world, as mentioned in the research conducted by Kristen Cowan and ie. al [58], [66]. It is therefore not surprising that sound has evolved much more in comparison, being used ever since the advent of video games.

C. Effects on the users

The use of virtual reality (VR) technology is known for its immersive and progressive experience. However, it is not without its side effects, which have been noted throughout its existence [67]. One of the main issues with VR headsets is that they can cause dizziness and motion sickness, leading to nausea, vomiting, and in severe cases, sopite syndrome and vertigo [67] Users can also lose dynamic visual acuity while moving their head or body, which affects their balance and posture due to the use of similar but different kinds of motion in VR [68]. Additionally, it can cause dry eyes, blurry vision, twitching eyes, eye strain, and fatigue due to its immersive nature. However, users with pre-existing eye conditions can still use the device while wearing their prescribed glasses to experience the 3D effects of the VR headset [69], [70]. While VR sickness or cybersickness [71] is not persistent, overusing VR can lead to symptoms such as dissociation, depersonalization and derealization, which last only for a day if the individual refrains from using the technology the next day [72].

Virtual Reality (VR) technologies have been observed to have both positive and negative effects. While the overuse of VR devices can lead to harmful consequences [73], they have been found to be helpful for individuals who require mental health assistance [74]. VR has been shown to be particularly effective for young individuals who suffer from mental disorders such as stress, depression, and anti-social syndromes. VR-based games like VRChat enable players to engage in social interactions with people worldwide in a virtual space [63]VR technology has also been used in education [75] and to promote family activities. In cases of mild cognitive impairment (MCI), which is a transitional stage between normal aging and dementia [74], VR technology has been observed to be beneficial. However, the effectiveness of VR-based interventions in groups is not consistent [76]. VR technology has been shown to enhance hand-eye coordination, depth perception, reaction time, visual memory, peripheral vision awareness, and eye-related treatments such as Amblyopia and vision loss [70].

V. METHODS

A. Hypothesis and question

The rampant technological advancements have opened up new vistas in the field of virtual reality, affording us the opportunity to replicate various real-world activities and environments. However, this leads us to contemplate the extent of its utility when real-life experiences are hindered for certain reasons. The allure and pleasure of exploring the wilderness or open spaces such as beaches, where one can relish the sensory experiences without being overwhelmed, is critical for fostering good health [40]. The pertinent question that arises is the efficacy of virtual reality in creating a comparable stress-relieving experience.
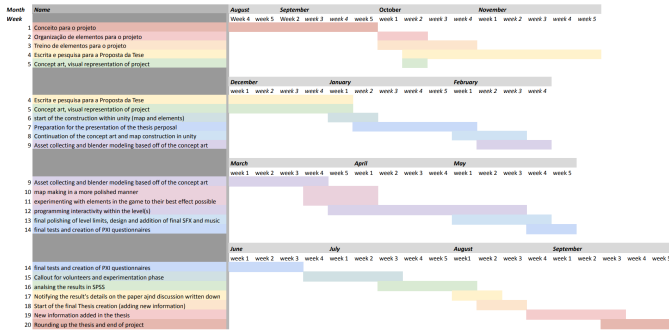
Fig. 1. Gantt timeline for the development of the thesis

Fig. 2. concept art for the first half of the game

Fig. 3. Early prototype of the level

VI. VARIABLES

The experiment will take into account the prevailing level of stress, focus, and tension of the participants prior to its commencement. It is essential to note the impact of the experiment before and after, but we should refrain from asking the volunteers directly to prevent any changes in their mindset. The participants' availability and preoccupation with other matters that may serve as distractions must also be considered.

VII. THE EXPERIMENT

In order to examine our hypothesis, we intend to develop a video game that provides a calming and focused experience for users. The game will feature visual elements that emulate serene surroundings, incorporating the components outlined in the article. To ensure optimal immersion for players, the game will be made in Virtual Reality.

We will be making the game with the Unity engine because of its compatibility with virtual reality applications. However, we must adhere to a strict budget, which means we will only be able to utilize VR headsets in this project.

This timeline outlines the development of the game and subsequent testing, analysis, and refinement of our thesis. While subject to change, it provides a general idea of the project's progress and completion (see figure 1).

The proposed experiment involves the traversal of a portion of an island, where players will explore the ambiance to help ease their minds. The island will feature beaches, dense forests and swamps, mountains, dynamic wildlife, plantations, water streams, and weather effects such as wind and sun rays. To enhance engagement, we plan to incorporate an indirect narrative based on marooned stories like Machim or Cast Away, with a focus on the peace brought by the wildlife on the island. In this narrative, a survivor of a shipwreck wakes up on a beach of a quiet island with no way out but to explore the variant environments and embrace the changes that occur during their adventure.

In addition to encountering various spaces and beings, players will also come across remnants of constructions that others built before their arrival. These include bridges, rails, ladders, makeshift buildings, and illustrations that will guide players and act as a source of storytelling without words or direct explanation. This approach will cr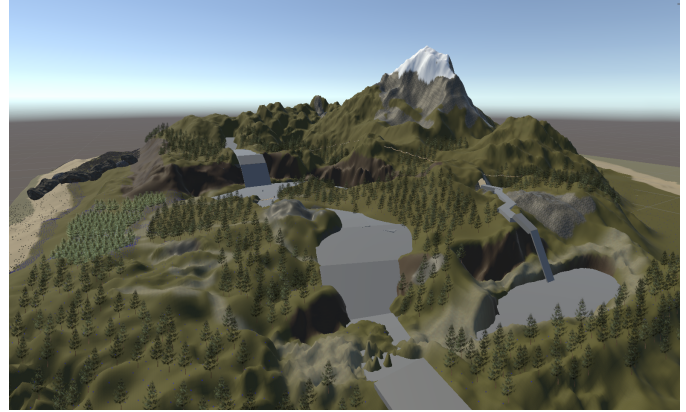eate the impression that players themselves constructed these items, giving the idea that they have been on the island for a while without any explicit mention.

The narrative of the game will be driven by the design and events that occur as players traverse through the level. It will intentionally be kept vague, so players do not need to understand the game's story if their focus is not on that aspect of the game.

The island will feature a variety of nature scenarios and paths that are easy to distinguish from the rest on the island. These paths will be easy to locate and have multiple options, so players can choose which path to take based on their preferences. Additionally, these paths, along with the virtual elements of nature, will create a sense of ease and comfort for players in the virtual space.

The game will conclude when players reach the peak of the island's tallest mountain, where they will construct a beacon to signal boats nearby. The pathway will be loosely based on natural landmarks from around Madeira, such as Pico Ruivo and Caldeirão Verde, combined into a long-level structure. This structure will provide players with multiple options to traverse the environments and reach the end, with little platforming or interactive challenges, mostly for variety to keep players engaged, along with different scenarios throughout.

Currently, we have developed a comprehensive framework for the game's world, along with concept art and sufficient models to initiate the mapping of the environment(see figure 2,3).

A. Measures

To measure player experience, we will use the PXI (Player Experience Inventory) [77] to evaluate the real-time effects of

the game, and for the game flow, we will use PQ (Presence Questionnaire) [78]. PXI is a direct method of evaluating real-time responses to a videogame's design choices and "second-order emotional experiences", describing the Functional Consequences and Psychological Consequences respectively [77]. The Presence Questionnaire resembles PXI to a certain degree, though it is a questionnaire made following the experiment. It focuses on the factors of immersion, sensory fidelity, involvement, and interface quality [78].

When the game has been completed, there will be an announcement for volunteers with all the details regarded here about the experiment, alongside a direct mention that the information gathered will be used for analysis of the effect of the experiment.

Before the experiment, there will be questionnaires using PQ to evaluate the user's current health regarding stress using a PQ questionnaire, their age to evaluate how it inflicts stress, their experience with VR and the way they currently cope with stress. After the experiment, there will be a questionnaire using PQ regarding the quality, resemblance, choices, and physical and mental status of the player after playing through the game, concluding with their final thoughts.

It is pertinent to note that there will be a wide range of tension, health issues, and individual differences among the potential candidates [63], [76]. It is crucial to understand these inconsistencies, as they have the potential to affect the results of the experiment. Therefore, we have designed the choice answers in a way that will help mitigate the tension of the experiment and minimize exposure, even if the data will only be used for analysis. It is advisable to analyze the effects of the experiment by considering the division between the more extreme cases and the common ones. This approach will help determine to what extent this method of meditation is effective.

Participants will engage in a brief 30-minute gameplay session of the VR experiment, after which they will be asked to complete a questionnaire to assess its impact on their internal tension levels in real-time. The experiment aims to evaluate whether consistency in VR usage can help alleviate from discomfort over time, as is often observed in individuals who adapt to a consistent sleep schedule. Given that VR technology has only recently become widely accessible since the mid-2010s [64], we believe that the target audience should be young adults between the ages of 18 and 30. This age range is more likely to be familiar with and adept at utilizing the technology in the experiment and being a more pressured moment in their lives

B. Discussion

From the early viewpoint of this experiment, it seems that, if created as efficiently and detailed as possible, the level itself will be at the least immersive for the users. The problem will be in the programming part of the project, which will have to be the part that will be worked on the longest before the volunteers get involved. Because of the time limit that there is, it is safer to have the weather be only sunny, only if there is time left will there be an addition of rain. The wildlife might

be better to limit them to smaller animals like birds. While the water's main pathway has been set, creating a consistent water flow plus interacting with the player will be difficult. The ending will have to be an animation of the player setting up a beacon to signal the boats. The trees and bushes already move for themselves and it is relatively easy to find appropriate sounds for each of these biome entities.

The level's architecture in general is mostly mapped out and every path is as different as can be, though further detail as to how the paths are made is needed. Because VR is pretty synonymous with causing dizziness, the levels will have to be consistent in the path's level

The proposed experiment will be centered on the realism aspect and will utilize peaceful element stimuli as a driving point. The immersion of volunteers into a virtual reality world will be achieved through the use of headphones and a VR headset. The proposed experiment aims to provide users with an immersive and autonomous experience that primarily focuses on relieving their stress [77]. The experiment will be designed to be easily accessible and entertaining, facilitating its usage during the user's leisure time.

C. Conclusion

The objective of our research is to determine the feasibility of creating a virtual environment that can provide a believable and relaxing gaming experience in a cost-effective manner, given the current time frame. Our findings indicate that there are numerous methods of immersing individuals in a fictional world, including media portrayal, ambient elements, and other effective strategies. Our research will take these factors into consideration to create a virtual reality environment with an immersive indirect narrative that can be analyzed for its effectiveness in assisting users in relaxation. In today's fast-paced world, it's important to provide individuals with effective methods of relaxation despite their busy schedules. Whether it's physical activity or mental relaxation, our experiment can provide a quick solution to help individuals regain control over their mindset [79].

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