IMPACT OF ENVIRONMENT ATMOSPHERE ON PLAYER ENGAGEMENT

WONG ZI MING

BACHELOR OF ARTS (HONOURS) GAME DESIGN

UNIVERSITI TUNKU ABDUL RAHMAN

MAY 2024

Declarations of Originality

I, Wong Zi Ming, declare that this research paper entitled “Impact of Environment Atmosphere on Player Engagement” is solely based on my original work except for the citations that have been acknowledge. I hereby declare that this project has not been previously submitted to any other party and will be submitted under the Degree of Bachelor of Arts (Honours) Game Design, under Universiti Tunku Abdul Rahman.

Wong Zi Ming

10/5/2024

ACKNOWLEDGEMENTS

I would like to thanks all who have contributed to the successful competition of this project. I would like to express my gratitude to my research supervisor, Ms Nik Norazira binti Abdul Aziz for her invaluable advice, guidance and his enormous patience throughout the development of the research.

In addition, I would also like to express my gratitude to my loving parents and friends who have helped and given me encouragement.

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Chapter 1: Introduction and Overview

In the realm of digital entertainment and gaming, the dynamics between players and their environment play an important role in shaping the overall gaming experience. This thesis explores the intricate relationship between the gaming atmosphere and player engagement, delving into the multiple aspects that contribute to this interactive synergy. The research is conducted as part of the UJMZ32010 courses, undertaken by the author, Wong Zi Ming 2003878, to discuss the nuanced impact of environmental atmospheres on player immersion and participation.

The remainder of this thesis structure is organized as follows:

Chapter 2: Literature Review: A comprehensive exploration of existing literature related to the impact of environment atmosphere on player engagement. This chapter provides a foundation for the current research by reviewing relevant theories, studies, and articles.

Chapter 3: Research Methodology: Details the research design, data collection methods, and analytical approaches employed in the investigation.

Chapter 4: Design and Implementation: Describe how the design implementation for the project.

Chapter 5: Discussion: A critical examination and interpretation of the findings, highlighting their implications and relevance to the broader field.

Chapter 6: Conclusion and Future Directions: Summarizes the key findings, draws conclusions, and proposes potential avenues for future research.

Above all, our team PolyMaster concluded 4 members in the development team, 2 game programmers (Leong Xue Qian and Leong Wan Yi) from Bachelor of Science (Honours) Game Development, 2 designers (Wong Zi Ming and Ho Keen Mun) from Bachelor of Arts (Honours) Game Design that developing the game for our Final Year Project, Chroma Journey from two proposal that we had presented.

1.1 Game Introduction

Chroma Journey is a 2.5D puzzle-platform horror adventure game with a Chinese cultural setting talking about the four auspicious beasts created the main character, Chroma as one of the guardians of the world to protect the east side seal of Four Fiends to keep the world peace. However, one fateful day, the seals of Azure Dragon were broken, unleashing the four malevolent beasts in the east. Therefore as the guardian, the player will control Chroma's step on the journey of seal reparation.

1.2 Game Objective

As the guardians of the seal, players are objective to repairing the seal where reaching the seal places. However, along the journey, puzzle-solving, obstacles, and the Four Fiends will be all along to stop the player.

1.3 Game Genre

Table 1.3 showing the genre of Chroma Journey.

Genre	Description
Adventure	The player is required to navigate the environment, seeking clues to solve puzzles and escape from the Fiends.
Horror	The setting of the gloomy and oppressive mood by the Fiends and the environment provides a pressure atmosphere to the player.
Platformer	The game features a 2.5D side view and requires players to utilize platforming skills to progress through each level.
Puzzle	Players need to employ strategic skills and make effective use of the resources and mechanics of the game to navigate puzzle obstacles and progress to the subsequent area.

Table 1.3: Game Genre

1.4 Game Story

The Four Auspicious Beasts, Azure Dragon, White Tiger, Vermilion Bird, and Black Tortoise, sealed the Four Fiends- Hundun, Qiongqi, Taotie, and Taowu, bringing peace to the world in ancient times. To safeguard the seal, they created Chroma as a guardian for the seal. However, one fateful day, the seals of Azure Dragon were broken, unleashing the four malevolent beasts in the east.

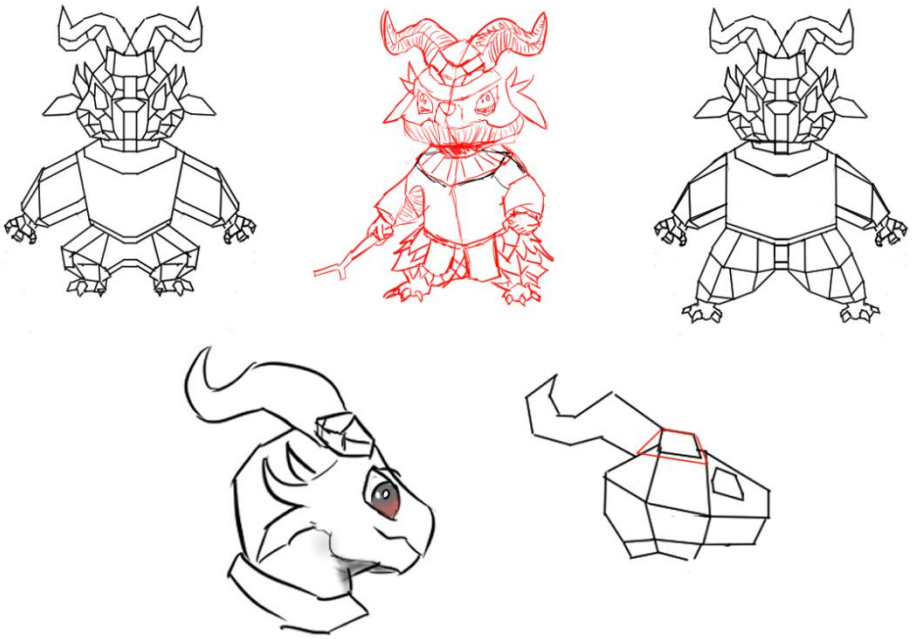

Figure 1.4: Chroma – Character Sketch

Taotie, the insatiable, devoured all in its path, leaving the deep forests barren of life. Qiongqi, the thief of sound, stole away the voices of creatures in the woods, rendering them speechless. Hundun, the embodiment of chaos, seized the sunlight, plunging the world into perpetual darkness. Taowu, the stealer of color, drained the vibrant hues from the world. In the face of this crisis, Chroma embarks on a journey to reseal the ancient threats and restore harmony to the world.

1.5 Game Art Style

As our group name PolyMaster, Chroma will be present in a low poly art style follow with flat color and monochromatic style for game environment. Below showing the example of two art style games.

Figure 1.5.1 Flat Color – Untitled Goose Game

Figure 1.5.2 Monochromatic – Silt

1.6 Unique Selling Point

The Chinese myth setting and backstory created the USP of Chroma Journey in terms of the Chinese culture that is rarely found in the current market. Other than that, mechanical-based puzzles for each Fiend in the story also provide a different gameplay during the game.

1.7 Game Mechanic

Player Movement	
Move Left	A
Move Right	D
Move Backward	W
Move Forward	S
Run (walk speed x 1.5)	Hold LShift
Jump/Climb	Spacebar
Interact (Push/Pull)	F
Throw (Aim)	Hold Right Click
Throw	Right Click (Holding Right Click)
Crouch (walk speed x 0.75)	Click C to Toggle/Switch

Table 1.7.1 Player Movement Table

Fix the jump to easily set the jumpable gap in the environment.

Movement	X axis	Y axis
Jump	0	+1
Walk Jump	+2	+1
Run Jump	+3	+1
Jump (back up)	0	+2
Walk Jump (backup)	+4	+2
Run Jump (backup)	+6	+2

Table 1.7.2 Jump Force of Player Movement

1.7.1Climb

It can be triggered when the character is close enough to the edge of the environment and the height of that edge is 2x the jump height.

Figure 1.7.1.1 & 1.7.1.2 Example of Player Climbing

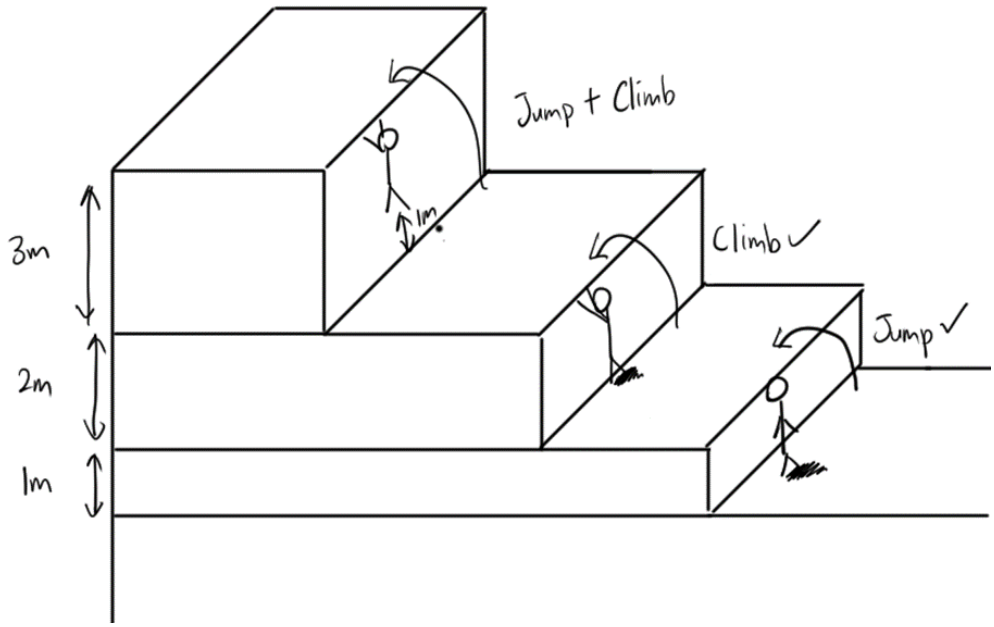

Figure 1.7.1.3 Climb Condition

1.7.2 Push/Pull

- Some props can move by push or pull in the environment to solve the puzzle. For example, player moves a box as the path for him to reach a higher place.
- When the player is close enough, hold the F key to activate the push/pull, release the F key, and return to idle.
- After active push and pull state, player able to move the movable props in the environment.
- During the state, decrease the player's movement speed.
- Same with the interact, trigger when player close enough with the props.

1.7.3 Stamina System

Run and jump will decrease player stamina, walk will slowly restore the stamina and rest will restore quicker.

Stamina Decrease Rate		
Movement	**unit**	**Percentage**
Jump	1 time	25%
Swim	1second	25%
Run	1 second	25%
Stamina Restore Rate		
Movement	**unit**	**Percentage**
Walk	1 second	20%
Idle	1 second	25%

Table 1.7.3.1 Stamina Decrease & Restore Rate

1.7.4 Swimming

Stamina will only decrease when players are moving or swimming around the water. Stamina will not decrease or restore when the player just floating on the water.

Action	Decrease Stamina	Restore Stamina
Stay/ Floating on Water	No	No
Moving / Swimming around the water	Yes	No

Table 1.7.4.1 Swimming Stamina Reaction

1.7.5 Light Mechanic

· Cave Monster: This monster will be attracted by the light. Therefore, whenever the player holding his light, the cave monster will start cashing the

player. During the cave level, this monster will take place as an obstacle that the player should avoid.

· Throwing light ball: The player is able to throw his light ball to distract the monster for the player to pass through. Once the thrown light ball touches the ground, it will Flash out and slowly decrease its brightness until completely dark. The player is only able to throw again when the light ball has exhausted its brightness.

· Light Ball exhausted time == 3 second.

· Light maximum attracts distance == 4 meters

1.7.6 Throwing

· Maximum throwing range == 6 m

· Minimum throwing range == 2 m

· Curve line to show the throw track for the player to clear on the destination of the light ball thrown. (If possible) / Show a circle on the ground for the destination of the light ball thrown.

· Camera will move be drag to the destination of thrown light ball.

1.7.7 Sound Mechanic

· Different Player Movement will affect the noises that will attract the awareness of monster during the game.

Movement	**Sound**	**Attract Distance**
Crouch	Small	1m
Walk	Medium	2m
Run	Big	3m

Table 1.7.7.1 Soud Attract Distance of Monster

1.8 Hardware and Software Requirements

Chroma Journey was designed as a PC game. There are hardware requirements to ensure smooth gameplay.

Hardware

Table 1.10.1 is a list of the hardware utilized on the user side and during development.

Development Hardware		Recommended User Hardware
Windows 10 & above	Operating System	Windows 10 & above
AMD Ryzen™ 7 5800HS, 3.20GHz or higher	Processor	Intel(R) Core(TM) i7-9750H, 2.60GHz or AMD Ryzen™ 7 4800H, 2.90GHz or higher
16 GB	Memory	8 GB
GeForce GTX 3050	Graphics Card	GeForce GTX 1660Ti
1.5TB SSD	Storage	500GB SSD

Table 1.8.1: Hardware Requirements

Software

Table 1.10.2 is a list of the software utilized during development.

Software	Description
Unity Game Engine	Used to develop the game. The chosen version is Unity 2022.2.1f1.
Visual Studio 2022	Used as a scripting tool
GitHub	Used as a collaboration tool to coordinate updates
Google Docs	Used as a writing tool for Game Design Document (GDD)
Discord	Used as a meeting and artwork uploading tool
WhatsApp	Used as the main communication tool
Photoshop 2020	Used as Graphic editing tool
Premiere Pro	Used as Video editing tool
Clip Studio Paint	Used as illustrate tool
3D Max	Used as 3D modeling tool
Blender	Used as 3D modeling tool

Table 1.8.2: Software Requirements

1.9 Budget

Table 1.11 shows the team's FYP budget.

Category	Item	Quantity	Price (RM)
Hardware	Drawing Tablets	2	0.00
	Laptop	4	0.00
Software	3D Max	2	0.00
	Adobe Photoshop	2	0.00
	Clip Studio	2	0.00
	GitHub	-	0.00
	Unity 2022.2.1f1	4	0.00
	Visual Studio 2022	2	0.00
Game Asset	3D Models	-	0.00
	Animation	-	0.00
	Visual Effects	-	0.00
Audio	Background Music	-	0.00
	Sound Effects	-	0.00
Communication	Discord	-	0.00
	Trello	-	0.00
	WhatsApp	-	0.00
Miscellaneous	Printing	4	800.00
	Promotional Material	1	150.00
		Total	950.00

Table 1.9: Budget

1.10 Schedule

Figures 1.12.1 and 1.12.2 show the FYP1 and FYP2 schedules, respectively.

No	Task	Group Members	Duration	Weeks						
				1	2	3	4	5	6	7
1	**Brainstorming**									
	Genre research	Everybody	2 weeks							
	Game Ideas	Everybody	2 weeks							
	Game concept	Everybody	2 weeks							
	Proposal preparation	Everybody	1 week							
2	**Designing**									
	Character Sketch	Keen Mun	2 weeks							
	Environment Sketch	Ziming	2 weeks							
	UI layout and design	Keen Mun	2 weeks							
	Level Design	Ziming	5 weeks							
3	**Production (Art)**									
	Modelling	Ziming, Keen Mun	3 weeks							
	Music and Sound effect	Ziming	3 weeks							
	Texturing	Keen Mun	3 weeks							
	Rigging	Keen Mun	2 weeks							
4	**Production (Programming)**									
	Player Movement	Wan Yi	2 weeks							
	Player Camera	Wan Yi	2 weeks							
	Enemy AI	Jane, Wan Yi	5 weeks							
	UI Function	Wan Yi	2 weeks							
	Game physics	Jane, Wan Yi	5 weeks							
5	**Milestone**									
	Progress presentation	Everybody	1 week							
	Bug fixing	Jane, Wan Yi	2 weeks							
	Quality Analysis	Everybody	2 weeks							

Figure 1.10.1: FYP1's Gantt Chart

No	Task	Group Members	Duration	Weeks												
				1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	**Production (Art)**																
	Modelling	Ziming, Keen Mun	10 weeks														
	Music and Sound effect	Ziming	10 weeks														
	Texturing	Keen Mun	5 weeks														
	Rigging	Keen Mun	3 weeks														
	Level Design	Ziming	7 weeks														
	Post Processing Effects	Ziming	5 weeks														
	VFX	Ziming	5 weeks														
2	**Production (Programming)**																
	Player Interaction Behavior	Jane, Wan Yi	12 weeks														
	Enemy AI	Jane, Wan Yi	12 weeks														
	Reward System (Clues)	Wan Yi	10 weeks														
	Sanity Bar system	Jane	12 weeks														
	Game physics	Jane, Wan Yi	10 weeks														
	Collectible Item	Wan Yi	5 weeks														
	Win / Lose Condition	Jane	3 weeks														
	SFX Implemention	Jane, Wan Yi	6 weeks														
	VFX Implemention	Jane, Wan Yi	6 weeks														
3	**Cutscene**																
	Start Cutscene	Everybody	6 weeks														
	Ending Cutscenes	Everybody	2 weeks														
4	**Milestone**																
	Final presentation	Everybody	1 week														
	Bug fixing	Everybody	3 weeks														
	Quality Analysis	Everybody	2 weeks														
	Game documentation	Everybody	2 weeks														
	Promotion	Ziming, Keen Mun	2 weeks														

Figure 1.10.2: FYP2's Gantt Chart

1.11 Project Scope

Table 1.13 summarizes each member's role and research areas.

Name	Role	Research Topic
Ho Keen Mun	– Lead 3D Artist – Level designer – Sound Designer	Texturing To Create Realistic Low Poly 3D Models
Leong Wan Yi	– Game Programmer – Visual effect artist	The Impact of Non-Diegetic UI Design on Player Experience in Platformer Games
Leong Xue Qian	– Lead Programmer – Mechanics and AI Programmer	Environmental Fluctuation: Player's Awareness and Adaptability in a Platform Adventure Game
Wong Zi Ming	– Lead Level Designer – 3D Artist – Sound Designer	Impact of Environment Atmosphere on Player Engagement

Table 1.11: Project and Member Scope

Chapter 2 Background Study and Literature Review

This chapter covers the background study and a review of relevant works to the research topic " Impact of Environment Atmosphere on Player Engagement " as an exploration of the contextual foundation for the research topic, aiming to establish a comprehensive understanding of the subject matter.

2.1 Introduction

The impetus behind undertaking this research stems from a compelling necessity embedded in the realm of game development by the author, driven by the aspiration to craft a gaming experience within the niche genres of puzzle horror and platform. It is recognizable the importance of high player engagement. In the complicated landscape of game design, especially for a challenging combination of puzzle-solving and horror elements, it is clear that to build a good game environment high meticulousness is needed. The development of such a game not only requires a deep understanding of hardcore level design but is also key to unraveling the mysteries of player engagement within the gameplay. This chapter embarks on a comprehensive journey, blending a background study and literature review, to delve into existing knowledge and theories about the impact of environmental atmospheres on player engagement. By synthesizing relevant literature, this chapter aims to lay the groundwork for understanding the intricacies of crafting immersive and engaging game environments, specifically tailored to the unique demands of the puzzle horror and platform genres.

2.2 Problem statement

The problem statement of this research project revolves around understanding the critical role of environmental atmospheres in shaping player engagement within digital gaming, particularly in the context of puzzle horror and platform genres. The challenge lies in elucidating how specific atmospheric elements impact player experiences, aiming to uncover design strategies that optimize player engagement.

2.3 Research Objectives

The primary objectives of this research are as follows:

- To analyze the impact of environmental atmospheres on player engagement in digital gaming.
- To identify key atmospheric elements that significantly influence player experiences.
- To provide insights into the design implications for creating more engaging gaming environments.

2.4 Research Question

As a form of guide during the research process and shaping the overall direction of a study to ensure that the investigation remains on track, research questions are stated below:

- What is the influence of environmental atmospheres on the level of player engagement in digital gaming?
- What are the specific atmospheric elements, such as visuals, sound, narrative, or others that have a significant impact on shaping player experiences?
- How to gain insights from the analysis of environmental atmospheres into the design implications for creating more engaging and immersive game environments?

2.5 Scope of study

This study is confined to the examination of digital gaming environments and their effects on player engagement in games. The findings aim to contribute to the growing body of knowledge surrounding the intersection of game design, psychology, and user experience. By understanding the nuances of player-environment interactions, game developers, designers, and researchers can enhance the overall quality of gaming experiences.

2.6 Literature Review

2.6.1 Article 1 : Level Design or Environmental Design

In this article Aydan Aliyeva (2024) elucidates the nuanced disparities between level design and environmental design, emphasizing their distinct roles in shaping player experiences within digital gaming environments. Aliyeva contends that while these design disciplines share a common goal of enhancing player engagement, they contribute to the gaming experience in fundamentally different ways.

Aliyeva's exploration of level design underscores its intricate involvement in structuring gameplay progression, challenges, and pacing. She highlights the imperative role of level designers in orchestrating seamless player experiences through meticulously crafted layouts and thoughtful integration of gameplay mechanics. This perspective aligns with the notion that effective level design is pivotal for maintaining player immersion and facilitating a sense of accomplishment (Aliyeva, 2024).

Conversely, Aliyeva delves into the realm of environmental design, accentuating its focus on aesthetic presentation, world-building, and immersive storytelling. By analyzing the visual and atmospheric elements crafted by environmental designers, she underscores the transformative power of game environments in evoking emotions and conveying narrative themes. Aliyeva's exposition underscores the pivotal role of environmental design in creating captivating and believable game worlds that resonate with players (2024).

By juxtaposing the insights gleaned from Aliyeva's delineation of level design and environmental design, it becomes evident that these disciplines synergize to shape the holistic gaming experience. The integration of well-crafted levels within immersive environments not only enhances player engagement but also contributes to the overall coherence and narrative depth of video games (Aliyeva, 2024).

In summary, Aydan Aliyeva's article serves as a valuable contribution to the discourse on video game design, shedding light on the complementary yet distinct roles of level design and environmental design. Her elucidation of these design disciplines enriches our understanding of how strategic integration of gameplay structures and immersive aesthetics can elevate the artistry and impact of interactive digital experiences.

2.6.2 Article 2 : The Psychology of Game Design: How to Keep Players Engaged

Tiana Crump's article (2024) delves into the intersection of psychology and game design, elucidating how understanding player psychology can enhance engagement and retention in video games. Crump underscores the significance of tapping into fundamental human behaviors and cognitive principles to create compelling gaming experiences that resonate with players.

The Basics of Player Psychology in Game Design

Crump emphasizes the importance of cognitive psychology principles in game design, such as reward and reinforcement, flow state, cognitive load theory, and problem-solving strategies. By applying these principles, game developers can optimize player engagement by balancing challenge and reward, providing meaningful feedback, and ensuring optimal cognitive load to sustain player immersion (Crump, 2024). Crump highlights the successful implementation of these principles in popular games like Candy Crush Saga, where intermittent rewards are strategically used to maintain player engagement through a rewarding feedback loop (2024). This exemplifies how psychology-driven design choices can translate into addictive and enjoyable gaming experiences.

Designing for Engagement

The article delves into strategies for designing engaging games, emphasizing the importance of varying difficulty levels and incorporating a rewarding feedback system. Crump cites examples from games like Dark Souls and Animal Crossing: New Horizons to illustrate how effective level design and feedback loops contribute to player motivation and sustained engagement (2024). Crump's

insights underscore the significance of creating meaningful challenges and providing immediate feedback to reinforce player actions. By leveraging cognitive psychology principles, game designers can cater to diverse player preferences and skill levels, fostering a sense of accomplishment and progression (2024).

The Power of Using Emotional Connection in Your Games

Crump discusses the role of emotional connection in game design, emphasizing the impact of compelling narratives, character development, and immersive world-building on player engagement. Games like The Last of Us and Skyrim are cited as examples of how emotional storytelling can evoke deep connections with players, enhancing immersion and longevity of gameplay experiences (2024). By integrating emotional narratives and meaningful character interactions, game designers can establish a profound connection between players and the game world, fostering lasting emotional experiences that transcend mere entertainment (Crump, 2024).

The Psychology of Game Choices

Crump explores the significance of player choices in game design, likening meaningful decision-making to the spices that enhance a gaming experience. Games like Mass Effect and The Witcher 3: Wild Hunt are cited for their implementation of impactful choices that shape the narrative and player experience (2024). The article underscores the importance of designing choices that reflect real-life complexities, providing players with meaningful agency and consequences. By balancing risk and reward, game designers can elevate player engagement and investment in the game's storyline (Crump, 2024).

Using Feedback to Improve Game Design

Finally, Crump discusses the role of player feedback in refining game design, highlighting examples from games like No Man's Sky and League of Legends. The iterative process of incorporating player feedback demonstrates the value of community engagement in optimizing game mechanics and content (2024). Crump's article underscores the iterative nature of game development,

emphasizing the importance of continuous improvement and responsiveness to player preferences. By leveraging player feedback, game designers can create more polished and resonant gaming experiences that cater to audience expectations and preferences (Crump, 2024).

2.6.3 Article 3: The Importance of Game Art in Player Engagement

Dream Farm Studio's article (2024) delves into the pivotal role of game art in enhancing player engagement and fostering deep connections with gaming experiences. Dream Farm Studio highlights several key strategies and techniques through which well-crafted game art can transform games into immersive storytelling experiences, ultimately driving brand engagement and marketability.

Enhancing In-Game Engagement through Game Art

This article emphasized the transformative impact of lifelike and immersive game art on player experiences. By meticulously crafting environments that evoke powerful emotions and settings, game artists can elevate gameplay beyond mere challenges, creating a sense of adventure and personal investment for players (2024).

Its also underscores the importance of unique and memorable characters in fostering player connection and engagement. Through distinctive visual features and character design, games like GTA: San Andreas, Assassin’s Creed, and Mario exemplify how character art can leave a lasting impact on players, cultivating deep emotional connections and cultural significance (Dream Farm Studio, 2024).

Facilitating Emotional Connection and Immersion

Dream Farm Studio discusses how game art enables players to connect with gaming experiences on a profound level. By leveraging visual storytelling techniques and character expressions, game artists can evoke strong emotions and immerse players within the narrative, fostering empathy and investment in the game world (2024).

Setting the Mood and Enhancing Engagement

The article highlights the pivotal role of art in setting the mood and tone of gameplay. Through color schemes, lighting effects, and visual cues, game artists can evoke specific emotions and enhance player engagement. By creating immersive environments that resonate with players, art becomes a powerful tool for shaping the player's emotional journey (Dream Farm Studio, 2024).

While Dream Farm Studio's article (2024) underscores the significance of personalization and brand engagement through game art, these aspects may not directly align with the specific focus of my research on game design and player engagement. Dream Farm Studio emphasizes how personalization, driven by visual customization options within games, enhances player satisfaction and investment. Additionally, they discuss how game art contributes to brand identity and marketability through distinctive visual styles and art direction, fostering organic marketing buzz and brand loyalty among players. The article concludes with practical recommendations for optimizing game art to maximize player engagement, emphasizing strategies such as understanding target audiences, choosing appropriate art styles, integrating sound effects, studying competition, and iterating based on feedback to create compelling visuals. While these insights are valuable, my research may prioritize other aspects of game design and player engagement.

2.6.4 Article 4: What is game environment design and why it’s important

Mario Kolovos's article (2024) delves into the fundamental principles of game environment design, emphasizing its core role in creating immersive and engaging player experiences. The article underscores the multidisciplinary nature of game environment design, drawing from architecture, art, storytelling, and psychology to craft virtual spaces that evoke emotion and enhance gameplay (Kolovos, 2024).

Kolovos highlights the concept of immersion as central to game environment design, focusing on how designers transport players to alternate realities where they can suspend disbelief and become fully engrossed in the virtual landscape

(2024). The article emphasizes visual storytelling as a fundamental principle, illustrating how visual elements convey narrative depth and context, enriching the player's experience and deepening their connection to the game world (Kolovos, 2024).

Furthermore, Kolovos discusses the interactive nature of game environment design, which includes designing dynamic spaces that respond to player actions and movements (2024). The article also explores the role of sound in game environments, emphasizing how audio elements establish mood, atmosphere, and spatial awareness, enhancing immersion and drawing players deeper into the game world (Kolovos, 2024).

The article addresses the importance of balancing aesthetics and functionality in game environment design, noting that while visual appeal is crucial, it must harmoniously coexist with usability to ensure a seamless gameplay experience (Kolovos, 2024). Additionally, the article highlights the evolution of game environment design, tracing its progress from early arcade games to modern AAA titles, and discusses the challenges and opportunities presented by advancing technology (Kolovos, 2024).

In conclusion, Mario Kolovos's article (2024) presents a comprehensive overview of game environment design, emphasizing its artistry, technical considerations, and impact on player engagement. The insights provided serve as a valuable resource for game developers and enthusiasts seeking to create captivating and unforgettable virtual worlds.

2.6.5 Article 5: The Art of Environment Design in Video Games: Creating immersive virtual worlds

The article delves into the critical role of environment design in shaping player immersion and emotional connection within video games, emphasizing captivating landscapes, detailed structures, atmospheric effects, lighting, and sound design as essential elements in creating compelling and believable game worlds (MoldStud, 2024).

MoldStud (2024) highlights the importance of atmospheric effects, dynamic weather conditions, day-night cycles, lighting, and sound design in enhancing realism and making game worlds feel alive. The interplay of these elements contributes to player immersion by creating a multisensory experience that makes the virtual world tangible and engaging. For example, the sound of footsteps echoing through a deserted hallway or the gentle breeze rustling leaves can evoke a strong sense of presence and enhance the overall atmosphere of the game environment.

The article also emphasizes the advantages of immersive environment design for both players and developers, suggesting that immersive environments increase player engagement, evoke emotional responses, influence decision-making, and provide a competitive advantage in the market (MoldStud, 2024). However, the review suggests that further elaboration or specific examples demonstrating the impact of these elements on gameplay experiences could enhance the depth of the discussion.

In conclusion, MoldStud's (2024) article effectively communicates the significance of atmosphere in video game design, illustrating how atmospheric effects, lighting, and sound design contribute to player immersion and emotional engagement, ultimately enhancing the overall gaming experience.

2.6.6 Article 6: The Art of Level Design in Game Development

The article explores the significance of level design in video game development, emphasizing the incorporation of narrative elements to enhance player engagement and emotional connection (MoldStud, 2024). MoldStud (2024) highlights the benefits of integrating narrative elements into level design, such as increased immersion, emotional resonance, guided experience, and the creation of a memorable gaming experience.

MoldStud (2024) underscores the pivotal role of narrative elements in fostering player engagement by giving players a reason to care about the game world and

its characters. When players feel connected to the narrative, they become more invested in the gameplay experience. Integrating narrative elements into level design can create a sense of immersion that resonates with players, leading to increased player satisfaction and overall success for the game.

The article outlines various techniques for effectively integrating narrative elements into level design. It discusses environmental storytelling, which involves designing game environments that convey narrative information organically through objects, symbols, and visual cues, encouraging player exploration and discovery of the game's backstory. MoldStud (2024) also emphasizes the importance of well-crafted NPCs with unique personalities and backstories, dialogues, cutscenes, and gameplay mechanics aligned with the game's narrative to create a cohesive and immersive experience.

Furthermore, MoldStud (2024) highlights the importance of striking a balance between gameplay and storytelling to ensure that narrative elements seamlessly integrate with the gameplay experience. By leveraging techniques such as environmental storytelling, well-written dialogues, and strategic use of NPCs and cutscenes, game designers can create immersive narratives that resonate with players and elevate the overall gaming experience.

2.6.7 Article 7: Game Environment Modelling – Unveiling Secrets to Keep Players Engaged

In exploring the secrets of game environment modeling, Ankit Dave (2023) delves into the fundamental processes that game developers undertake to craft immersive and captivating game worlds. Dave underscores the critical role of game environments in maintaining player interest and engagement, drawing parallels with popular games like Fortnite, PUBG, and GTA Vice City, where the environments themselves serve as compelling backdrops for gameplay experiences. Game environment modeling, as defined by Dave (2023), involves the meticulous creation of 2D or 3D arenas where game narratives unfold. This practice encompasses a wide array of elements, including character design,

landscapes, architectural structures, and interactive mechanics, all aimed at illustrating a cohesive and engaging game storyline.

The article by Dave (2023) delineates two primary types of game environment modeling: 2D Modeled Game Environment and 3D Modeling-based Game Environment. The former, characterized by retro-stylized aesthetics and simpler design complexities, offers a nostalgic journey for players and requires less computational power compared to its 3D counterpart. Conversely, 3D-modeled environments immerse players in visually rich and interactive experiences, featuring dynamic lighting, realistic movements, and expansive exploration angles. Within the realm of 3D modeling, Dave (2023) introduces distinctions between Low Poly Game Environments and High Poly Game Environments, highlighting their respective benefits in terms of efficiency and visual fidelity.

Dave (2023) further emphasizes the importance of tailoring game environment modeling for different platforms, such as PCs, consoles, and mobile devices. For PC and console platforms, the focus is on high-quality visuals, detailed design elements, and immersive transitions to maximize player experience on larger screens. In contrast, mobile game environments prioritize minimalism and efficiency, accommodating smaller screens while maintaining visual integrity. The article underscores the significance of leveraging appropriate aesthetics, sourcing design inspiration, selecting the right game engine, and optimizing lighting and color settings to enhance the mood and tone of game environments across diverse platforms.

In conclusion, Dave's (2023) guide to game environment modeling offers invaluable insights into the intricacies of crafting immersive game worlds. By outlining step-by-step processes, addressing essential considerations, and acknowledging potential challenges, the article provides a comprehensive roadmap for game developers seeking to create captivating and engaging environments that resonate with players.

2.6.8 Article 8: Crafting Digital Realms: The Art and Science of Game Environment Design and Development

Galiniostech (2023) delves into the intricate art and science of game environment design and development, shedding light on the foundational elements that underpin immersive digital realms within video games. The blog articulates game environments as pivotal canvases where narratives unfold and player engagement flourishes, emphasizing their role in shaping gameplay experiences. Conceptualization and design are highlighted as crucial initial phases, where visual style, mood, and atmosphere are defined through collaborative efforts, supported by storyboards, sketches, and concept art to realize the envisioned game world.

The process advances into 3D modeling and asset creation, elucidating how 3D artists sculpt intricate details into characters, objects, and terrain, infusing the environment with unique flavor and depth. Galiniostech (2023) then underscores world building in game development, drawing parallels to constructing a puzzle, where every element harmoniously fits to craft cohesive and engaging virtual worlds. Level design emerges as a meticulous endeavor, ensuring balanced gameplay through strategic placement of challenges and encounters, while environmental storytelling enriches the narrative fabric of the game world through subtle visual cues.

Moreover, the blog expounds on dynamic game worlds that evolve in response to player actions, embracing dynamic systems like day-night cycles and weather patterns to enhance immersion. Delving into technical aspects, Galiniostech (2023) elaborates on optimization techniques that ensure smooth performance across diverse platforms, physics engines that handle interactive elements, and advanced lighting and shading techniques that enrich visual fidelity. Furthermore, the importance of immersive audio in game environments is highlighted, elucidating how soundscapes and ambient noise complement visuals to transport players into captivating digital realms. Galiniostech (2023) encapsulates the intricate fusion of artistry and technology that defines game environment design

and development, providing invaluable insights into the craft behind creating compelling virtual experiences.

2.6.9 Article 9: Decoding the Psychology of Colors in Games

Polydin Studio's (2024) exploration of color psychology in video games offers a comprehensive examination of how colors influence player experiences, emotional responses, and gameplay dynamics. The blog underscores the multifaceted functions of color, ranging from establishing visual hierarchy and conveying progression to defining gameplay mechanics and facilitating content variation within games. By dissecting the intricate interplay between color and game design, the analysis provides valuable insights into the strategic use of color to evoke emotions, create brand identities, and direct player attention within virtual environments. This understanding of color psychology enriches game developers' ability to craft immersive and engaging experiences that resonate deeply with players, fostering emotional connections and enhancing retention rates.

The examination of color's role in visual hierarchy within games aligns with established principles of design theory (Polydin Studio, 2024). By employing contrasting hues and vibrant palettes, game designers can effectively guide player focus and emphasize critical elements within the game environment. Moreover, Polydin Studio (2024) highlights color progression as a narrative tool, demonstrating how shifts in color palettes can evoke emotional responses and enhance player immersion. This narrative continuity, facilitated by strategic color usage, contributes to the overall coherence and engagement of the gaming experience.

Polydin Studio's (2024) discussion on the impact of color on gameplay mechanics elucidates the practical implications of color design within video games. Through color-coded indicators and visual signifiers, developers communicate essential information to players, facilitating comprehension and decision-making processes during gameplay. The blog also underscores the significance of brand identity and emotional resonance in game design,

emphasizing how consistent color branding fosters player loyalty and enriches the overall gaming experience. This comprehensive analysis of color psychology underscores its transformative potential within game design, offering practical insights for developers seeking to optimize player engagement and retention through strategic color choices.

In conclusion, Polydin Studio's (2024) exploration of color psychology in games serves as a valuable resource for game developers and researchers alike, illuminating the profound impact of color on player experiences and game design. By decoding the psychology behind color usage in games, the analysis provides a nuanced understanding of how colors influence emotions, guide attention, and shape gameplay dynamics. This scholarly examination not only enriches the theoretical discourse on color psychology within video games but also offers practical insights for enhancing player engagement, fostering brand loyalty, and optimizing overall gaming experiences.

2.6.10 Article 10: How To Create Atmosphere In Video Games

Marco's exploration of creating atmosphere in video games (2023) provides a detailed analysis of the various elements that contribute to crafting immersive game experiences. The blog emphasizes the critical role that atmosphere plays in player engagement and retention, highlighting how it extends beyond gameplay mechanics to encompass artwork, audio, level design, and narrative. By drawing examples from popular titles like God of War and Red Dead Redemption 2, Marco underscores the impact of atmosphere on player immersion, showcasing how compelling environments can captivate players and enhance their gaming experiences.

A notable aspect of Marco's discussion is the inclusion of mobile gaming as a significant platform for atmospheric game experiences (2023). The blog acknowledges the rapid growth of the mobile gaming industry and underscores the importance of conveying atmosphere effectively even on smaller platforms. Marco cites examples from mobile games like Last Pirate Survival Island Adventure and titles from Gala Bingo, demonstrating how specific imagery and

aesthetics can create a compelling atmosphere that resonates with players, despite the limitations of mobile devices.

Furthermore, Marco offers practical advice for game developers seeking to enhance atmosphere in their designs (2023). The blog advises on selecting graphical styles that align with the narrative tone, utilizing recognizable color tones for branding and thematic consistency, and emphasizing the importance of sound design in evoking emotions and enhancing immersion. By integrating these elements effectively, developers can create cohesive and captivating atmospheres that elevate the overall gaming experience and resonate with players across diverse gaming platforms.

In conclusion, Marco's examination of atmosphere in video games (2023) contributes valuable insights to the field of game design, emphasizing the holistic approach required to craft immersive and engaging gaming experiences. By exploring the interplay of artwork, audio, design, and narrative, and providing practical guidance for developers, the blog underscores the significance of atmosphere in fostering player engagement and underscores its critical role in shaping the success of modern video games across various platforms.

2.6.11 Article 11: Atmosphere & Progression

Michael Filimowicz's exploration of atmosphere and progression in video games (2023) delves into the multifaceted elements that contribute to crafting immersive gaming experiences. Filimowicz emphasizes the importance of various atmospheric components, such as lighting, color palette, weather effects, music, ambient audio, and sound effects, in setting the mood and tone of a game. By drawing parallels with film and theater traditions, Filimowicz highlights how these elements can evoke specific emotions and enhance player immersion. The discussion underscores the interconnected nature of these atmospheric elements, emphasizing their collective impact on creating a cohesive and engaging game environment.

Moreover, Filimowicz delves into the concept of progression and pacing within video games (2023), elucidating how developers structure gameplay to ensure a compelling player experience. The blog outlines key principles of game progression, including the evolution of mechanics, experience duration, ancillary rewards, practical gameplay rewards, and difficulty levels over the course of the game. By referencing game designer Mike Lopez's insights, Filimowicz provides a comprehensive framework for developers to design gameplay that evolves naturally and maintains player engagement. Additionally, Filimowicz acknowledges other critical aspects of progression, such as the introduction of new player actions, story advancement, and character growth, which collectively contribute to shaping the player's journey through the game.

In conclusion, Michael Filimowicz's examination of atmosphere and progression in video games (2023) offers valuable insights into the nuanced design elements that contribute to creating captivating gaming experiences. By integrating atmospheric components effectively and structuring progression thoughtfully, developers can elevate the overall quality of their games, fostering player engagement and immersion. The comprehensive analysis provided by Filimowicz underscores the intricate relationship between design elements and player experience, providing a foundation for further research and development in the field of game design and interactive storytelling.

2.6.12 Article 12: How to Look at Atmosphere in Video Games

Kristian Saflor's exploration of atmosphere in video games (2017) provides insightful perspectives on the pivotal role of environmental design in shaping player experience and emotional engagement. Saflor emphasizes the significance of atmosphere as an intricate outline of a game's mood and themes, drawing parallels between entering an unfamiliar room and navigating video game environments. Through careful analysis of design elements such as lighting, color palette, textures, and small details like shadows and environmental damage, Saflor underscores how these components contribute to establishing the tone and emotion of a game level.

Figure 2.6.11.1 Example of room atmosphere

Saflor's discussion on the use of colors as fundamental attributes to creating focal tones within video game levels draws from scholarly work by Elkins (2007), highlighting the psychological impact of color on player perception and emotional response. By associating vibrant colors with happiness and muted tones with mystery or foreboding, Saflor elucidates how color choices can evoke specific emotions and enhance player immersion. Furthermore, Saflor's exploration of lighting setup and texture usage underscores how these elements further amplify the atmosphere, drawing players deeper into the world of the game.

Moreover, Saflor underscores the immersive nature of atmosphere in video games, highlighting its role in building emotional connections and engagement beyond mere aesthetics. Atmosphere, according to Saflor, enables players to be fully engaged by eliciting emotional responses and shaping perceptions of the game world. By presenting atmosphere as a distinct entity within video games, Saflor emphasizes its significance alongside other traditional elements like characters, story, and music, asserting that atmosphere invites players to interpret and connect with the game world based on personal experiences and emotions.

Chapter 3 Research Methodology

3.1 Design Structure

This study adopts a comprehensive approach to explore the impact of environment atmosphere on player engagement in video games. The research design integrates qualitative and quantitative methods to investigate the relationship between atmospheric elements and player experiences within gaming environments.

Quantitative Methodology: The quantitative component of this study will employ numerical measurements and statistical analysis to assess the objective aspects of environment atmosphere. Parameters such as lighting conditions, color palettes, sound effects, and visual effects will be quantified to understand their influence on player engagement. Surveys or experimental gameplay sessions may be conducted to gather quantitative data on player behaviors, interactions, and preferences within varied atmospheric settings.

Qualitative Methodology: In parallel, qualitative data will be collected through in-depth interviews, focus groups, or open-ended surveys to capture subjective experiences and perceptions of environment atmosphere among players. Participants will be encouraged to articulate their emotional responses, immersion levels, and overall engagement in relation to specific atmospheric attributes encountered in gaming environments. Qualitative analysis will focus on identifying themes, patterns, and narratives that emerge from players' subjective experiences.

The integration of quantitative measurements and qualitative insights will provide a comprehensive understanding of how environment atmosphere influences player engagement in video games. By combining objective assessments with subjective perceptions, this research design aims to elucidate the nuanced interplay between atmospheric elements and player experiences, contributing to a deeper comprehension of the factors that enhance or detract from player engagement within virtual worlds.

3.2 Survey Design

The survey instrument for this study will utilize Google Forms, providing a user-friendly platform for data collection. Question development will be informed by an extensive literature review and aligned with the research objectives, ensuring that the questions are tailored to address specific aspects related to color usage and player engagement in video games. The survey will feature a combination of multiple-choice questions, allowing for structured responses, and open-ended questions, enabling participants to provide detailed insights and perspectives.

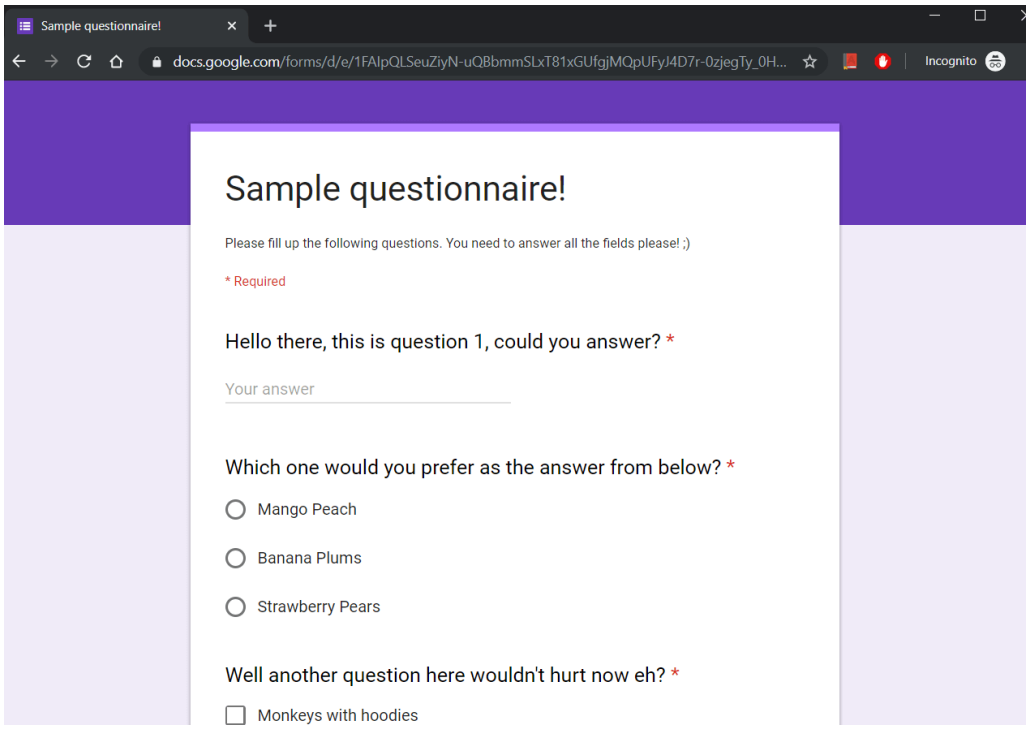

Figure 3.2.1 Sample of Google Forms Survey Design

3.3 Target Population and Sampling

The target population for this survey includes individuals involved in gaming, specifically gamers and game developers. Inclusion criteria will encompass individuals of varying ages and levels of gaming experience, ensuring a diverse representation within the target population. Random sampling will be employed to recruit participants, enabling the inclusion of individuals with different backgrounds and perspectives, including those with limited gaming experience who can provide valuable insights as well.

3.4 Recruitment and Data Collection

Participants will be recruited through multiple channels, including online platforms, social media communities, email invitations, and physical outreach where feasible. The data collection process will involve distributing the survey link via Google Forms to reach a broad audience of gamers and game developers. Ethical considerations will be paramount throughout the recruitment and data collection phases, with emphasis on obtaining informed consent from participants and ensuring the confidentiality and anonymity of their responses. These measures will uphold ethical standards in research and protect the rights of participants.

3.5 Survey Instrument Development

The survey instrument used in this study was developed to gather both quantitative and qualitative data pertaining to environment atmosphere and its influence on player engagement in video games. The development process involved several key steps to ensure the survey's alignment with the research objectives and its effectiveness in eliciting meaningful responses from participants.

3.5.1 Question Development

The development of survey questions was informed by a comprehensive review of relevant literature on environment atmosphere in video games and its relationship to player engagement. Drawing from established frameworks and theoretical perspectives, a set of questions was formulated to capture various dimensions of environment atmosphere, including visual aesthetics, audio elements, and immersive qualities.

Questions were designed to assess participants' subjective experiences and perceptions of environment atmosphere, as well as their engagement levels within gaming environments. Both closed-ended (multiple-choice) and open-ended questions were included to facilitate quantitative analysis of specific variables and qualitative exploration of participants' opinions and emotions. Questions are stated as below:

Demographic Information:

1. What is your age?

2. What is your gender?

3. How many hours per week do you typically spend playing video games?

Atmospheric Elements:

4. How important are the following atmospheric elements in video games to you? (Rate on a scale from 1 to 5)

Visual aesthetics (e.g., color palette, lighting, textures)

Audio effects (e.g., background music, sound effects)

Environmental details (e.g., weather effects, ambient sounds)

Immersive qualities (e.g., realism, believability)

Player Engagement:

5. How engaged do you typically feel when playing video games with immersive atmospheric elements? (Rate on a scale from 1 to 5)

Which specific atmospheric features enhance your overall engagement in video games? (Select all that apply)

Realistic graphics

Atmospheric lighting

Dynamic weather effects

Evocative sound design

Detailed environmental storytelling

Emotional Response:

6. How do atmospheric elements in video games affect your emotional response while playing? (Open-ended response)

7. Can you recall a specific gaming experience where atmosphere significantly enhanced or detracted from your overall enjoyment? Please describe.

Preference and Immersion:

8. Do you prefer games with specific atmosphere themes (e.g., horror, fantasy, sci-fi) over others? If so, please specify.

9. How important is atmosphere in influencing your overall immersion and enjoyment of video games? (Rate on a scale from 1 to 5)

Player Behavior:

10. How does atmosphere impact your exploration of gaming environments? (Open-ended response)

11. Does atmosphere affect your decision-making or gameplay strategies? Please explain.

Suggestions and Feedback:

12. What improvements would you like to see in the integration of atmosphere in video games to enhance player engagement? (Open-ended response)

13. Any additional comments or feedback regarding the atmosphere and its impact on your gaming experiences?

3.6 Limitations

Sampling Bias: Despite using random sampling techniques, the survey may still encounter biases inherent to online recruitment methods. For example, participants who are more active on social media or online gaming communities may be overrepresented, potentially skewing the sample demographics.

Generalizability: The findings of this study may be limited in their generalizability to the broader gaming population. The sample size and composition, as well as the specific gaming contexts investigated, could restrict the applicability of results to different gaming genres or player demographics.

Subjectivity in Atmosphere Assessment: Assessing environment atmosphere is inherently subjective and influenced by individual preferences and perceptions. Different participants may interpret atmospheric elements differently, affecting the consistency of qualitative data interpretation.

Time Constraints: The study's scope and timeline may limit the depth of data collection and analysis. Conducting thorough qualitative interviews or capturing nuanced quantitative measurements within gaming environments could be constrained by practical considerations.

Chapter 4 Design and Implementation

In this chapter, the implementation of atmosphere elements in the game project will be detailed, along with an exploration of the impact of these elements on player engagement. The chapter will cover the integration of visual aesthetics, audio effects, and immersive qualities into the game environment, followed by an analysis of their influence on player experiences.

4.1 Concept Art

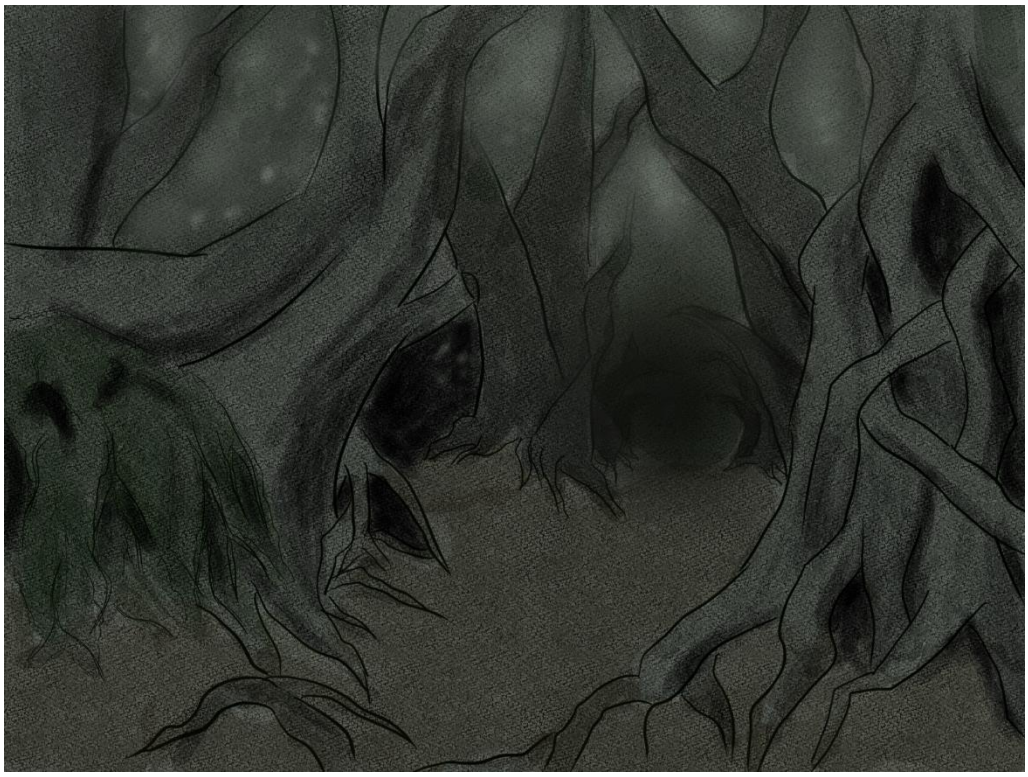

Figure 4.1.1 Concept Art 1

Figure 4.1.2 Concept Art 2

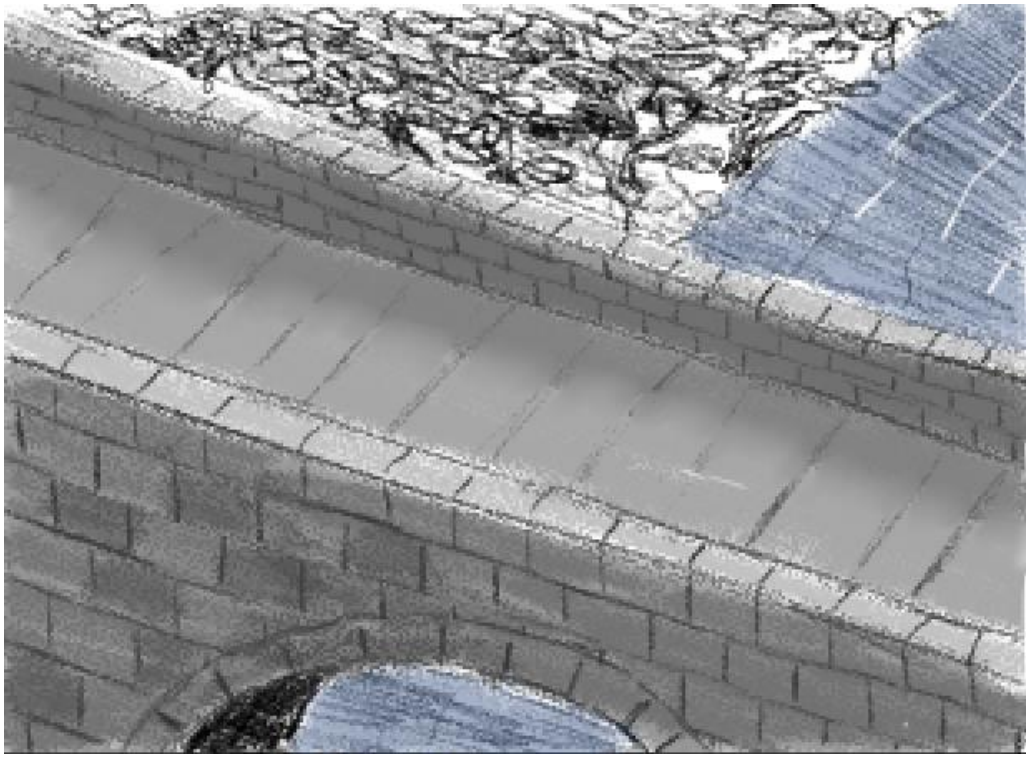

Figure 4.1.3 Concept Art 3

Figure 4.1.4 Concept Art 4

The concept art features a palette of predominantly somber black colors, strategically chosen to evoke the atmosphere of a world descending into chaos within the game. This deliberate use of dark hues conveys a sense of foreboding and uncertainty, aligning with the narrative theme of a world in turmoil. By employing this color scheme, we aim to immerse players in the emotional and visual landscape of the game, enhancing the overall impact of the storytelling and thematic elements. The contrast between light and shadow accentuates the dramatic tension, creating a compelling and immersive experience for players as they navigate the game's evolving narrative.

4.2 Character Design

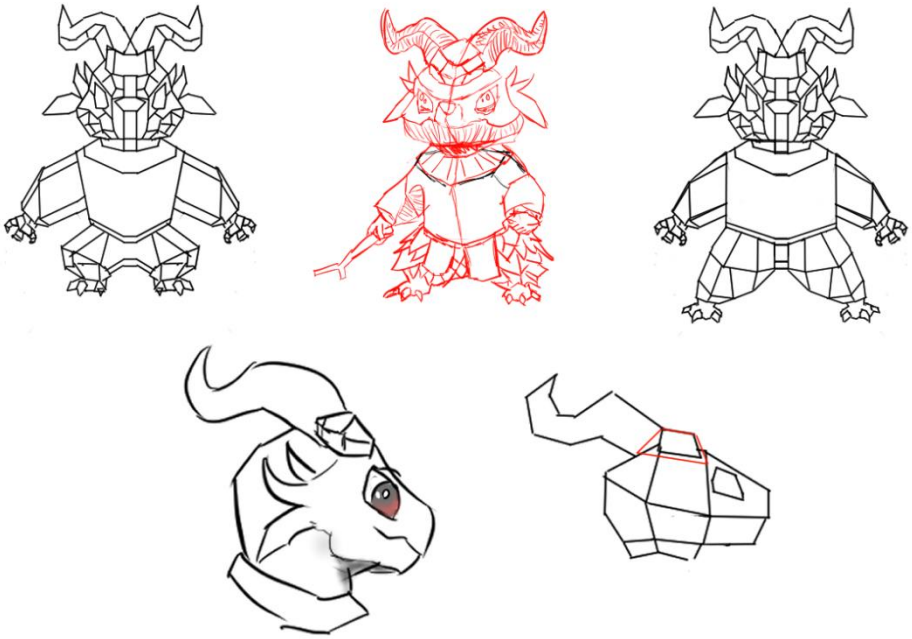

Figure 4.2.1 Chroma Character Design Sketch

In the character design, we incorporated Chinese elements prominently, aligning with the background story of Chroma as the guardian of the Oriental Blue Dragon. This thematic connection influenced the design choices, with dragon elements integrated into Chroma's visual aesthetics. The color palette focused on red and yellow, which hold significant cultural symbolism in China, representing hope and happiness. By leveraging these colors and thematic motifs, we aimed to enrich the narrative experience and create a deeper connection between the character and the game's cultural context. This deliberate design approach adds layers of meaning and resonance to Chroma's visual portrayal, enhancing player engagement and immersion in the game's world.

4.3 Story Narration and Setting

In the game "Chroma Journey," we leverage Chinese mythological stories to establish a rich narrative backdrop that immerses players in the game's world. The unique narrative design aims to deepen players' understanding of the story, drawing inspiration from mythological elements to enhance immersion. For instance, environmental changes within the game reflect the abilities stolen by ferocious beasts, aligning with Chroma's quest to seal these creatures and restore balance. By integrating story elements into gameplay environments, we create a

compelling and immersive experience that enhances player engagement and investment in the game's narrative journey.

Figure 4.3.1 Hundun Level Environment

The level's dark design aligns with our narrative background, creating a cohesive atmosphere that enhances the player's immersion in the story. This intentional choice reflects elements of the game's narrative, emphasizing thematic elements such as mystery, danger, or suspense. By visually integrating the environment with the storyline, we aim to evoke specific emotions and reinforce the game's overarching themes, ultimately contributing to a more engaging and cohesive player experience.

Figure 4.3.2 Taotie Level Environment

The Taotie level's vibrant green design is a deliberate choice to align with the background story, where the Taotie creature's insatiable appetite and incredible digestion, leading to increased environmental pollution, are central themes. This environment, rich with methane and other pollutants, is visually represented through the green color palette and atmospheric elements. By integrating these narrative details into the level design, we aim to immerse players in the world of Chroma Journey, emphasizing key story elements and enhancing the overall thematic experience while highlighting the environmental impact of the Taotie creature's activities.

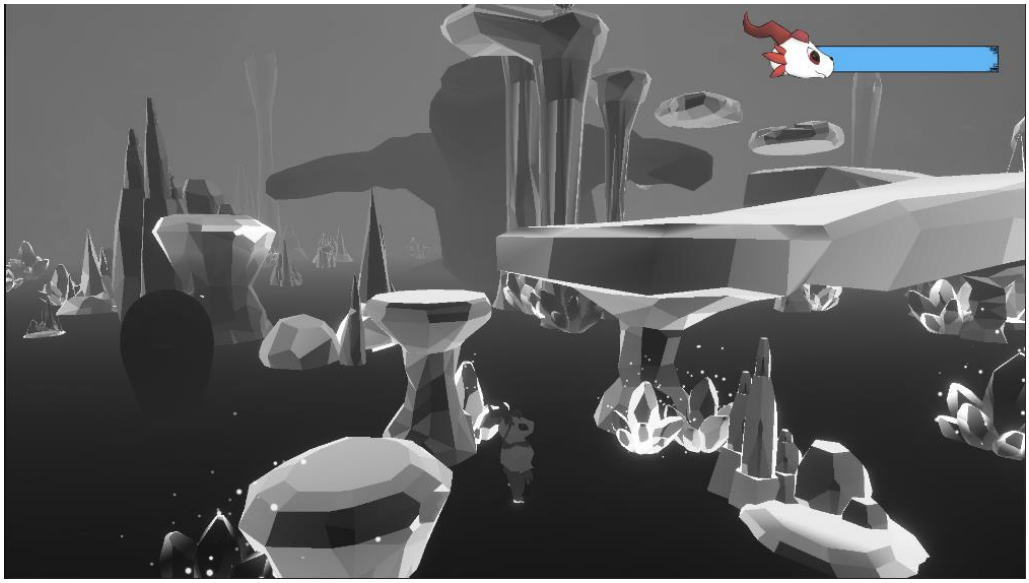

Figure 4.3.3 Qiongqi Level Environment

The appearance of the tube card in black and white in the picture is a deliberate design choice that reflects the background story of Qiongqi stealing the color from the world. As players progress through the game, the gradual return of color symbolizes the unfolding narrative and the restoration of balance within the game's universe. This visual representation not only enhances the thematic elements of the story but also serves as a dynamic storytelling device that engages players in the evolving game world. By integrating this narrative-driven design into the gameplay, we aim to heighten player immersion and emotional connection to the unfolding story.

Figure 4.3.4 Taowu Level Environment

The design of the Taowu level features a silent, deep forest setting that aligns with the game's background story. This environment immerses players in a world where sound has been stolen, creating an eerie and atmospheric atmosphere. The visual elements of the level, characterized by dense foliage and muted tones, reinforce the narrative theme of sound deprivation. By integrating this thematic design into the level, we aim to enhance player engagement by evoking a sense of mystery and intrigue tied to the story's premise.

4.4 Lighting and Atmosphere

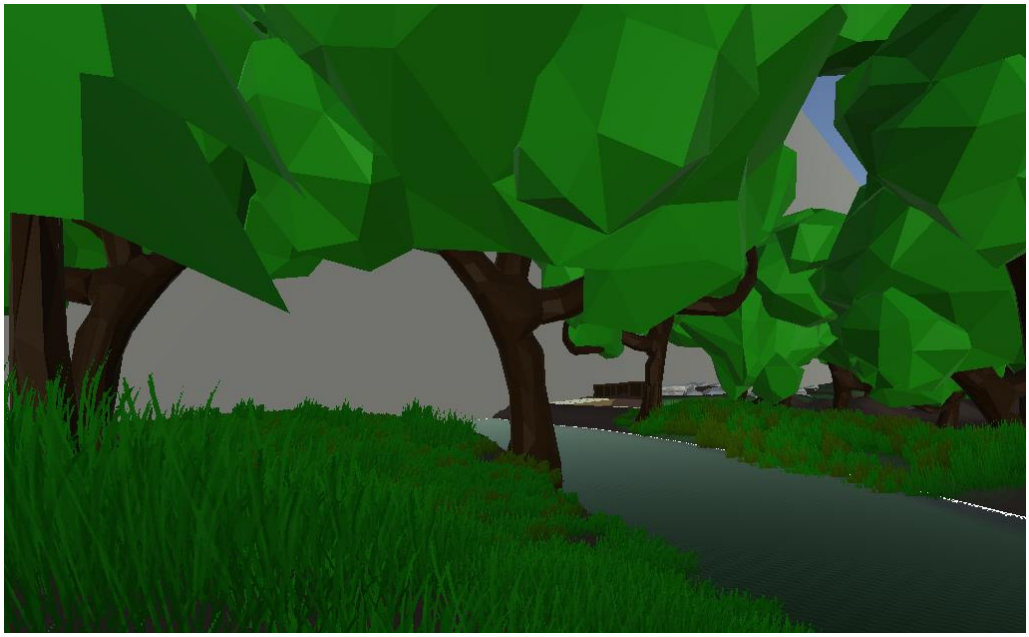

Figure 4.4.1 Environment before implement Lighting and Atmosphere

Figure 4.4.1 Environment after implement Lighting and Atmosphere

Figure 4.4.3 Environment before implement Lighting and Atmosphere

Figure 4.4.4 Environment before implement Lighting and Atmosphere

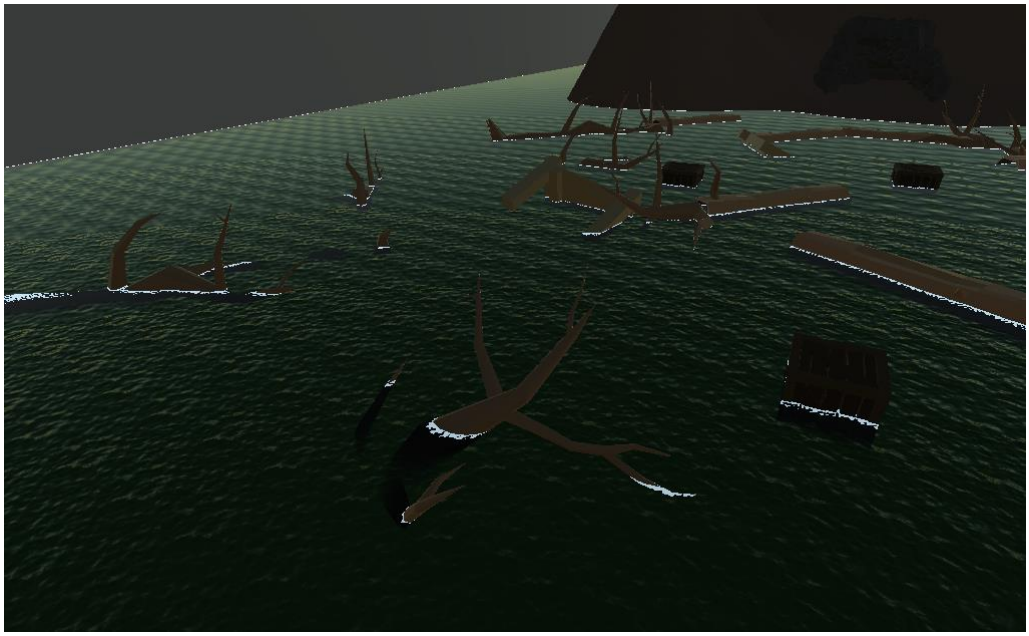

Figure 4.4.5 Environment before implement Lighting and Atmosphere

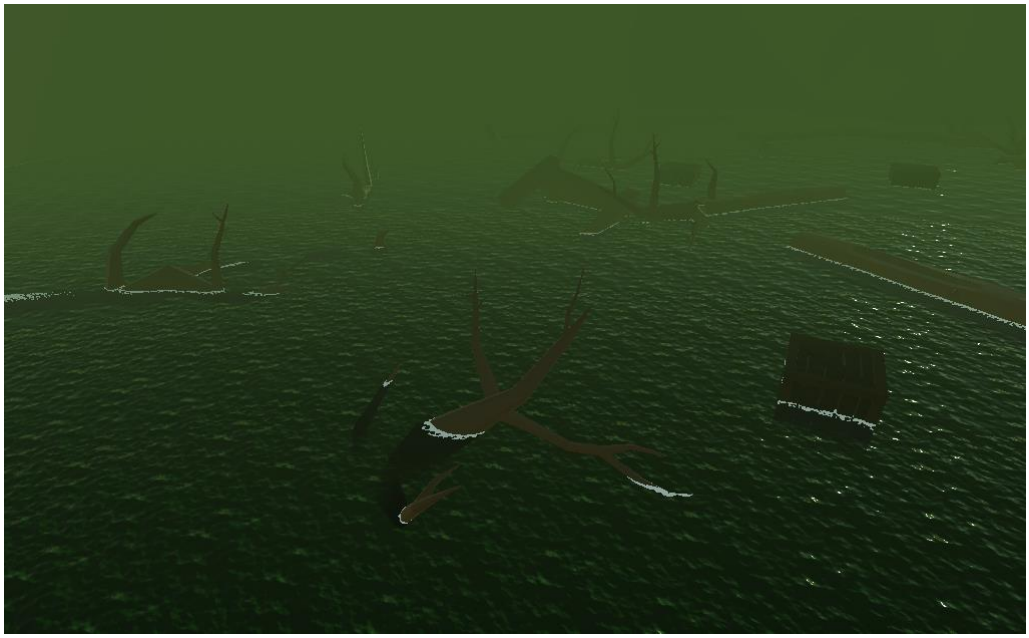

Figure 4.4.6 Environment before implement Lighting and Atmosphere

In the light and atmosphere design, we drew inspiration from Silent Hill to shape the environmental aesthetics, emphasizing an eerie and mysterious atmosphere. One key element we integrated was the use of fog, reminiscent of the iconic visual style of Silent Hill, which enhances the sense of mystery and depth within the environment. Additionally, various visual effects were strategically employed to enhance realism and evoke life in the game world. For instance, fallen leaves were incorporated in the forest setting to add texture and realism,

while caves featured floating smoke to intensify the atmospheric ambience. The inclusion of methane in the lake area further heightened environmental immersion, creating a distinctive and immersive atmosphere that contributes to the overall player experience. These atmospheric enhancements were designed to engage players and evoke a sense of intrigue and curiosity as they explore the game environment.

4.5 Environment Changes Mechanic

As a core game objective, players will collect elemental balls scattered throughout the game environment, each representing a vital component of the seal that maintains its strength. The game mechanics are designed such that significant events occur when players pick up these elemental balls. Across different levels—cave, forest, and lake—players must collect a total of three elemental balls to progress. Each collection triggers environmental changes that dynamically reflect the evolving narrative and gameplay progression. This strategic design not only drives player engagement but also enhances the immersive storytelling experience by intertwining player actions with meaningful narrative developments.

Level's elements ball	**Original Environment Atmosphere**	**The environment surrounding the element ball**	**Environment after pick up**
Tutorial level	nope	nope	nope
Cave	Darkness fewer light sources	Light source's brightness increase	Brightness decrease
Lake	Biogas and dirty water	No Biogas around and water becomes blue	Biogas and dirty water come back
Forest	No sound except for the player	Can hear sound	Sound missing again
Boss	Monochromatic/ Black and white only	nope	nope

Table 4.5.1 Environment Changes Table

4.6 Music and Sound Effect

We incorporated various environmental sound effects such as bats flapping their wings, water dripping in caves, and gravel falling to enhance realism. Additionally, we aimed to implement distinct audio profiles for different environments, reflecting the unique characteristics of each location. While we strived to tailor these effects to player interactions, time constraints occasionally limited our ability to fully realize this aspect.

Figure 4.6.1 Ambient Sound Recover Area

Notably, in the forest level, we intentionally withheld environmental sound effects initially to emphasize the absence of sound as part of the narrative backdrop. As players approach the elemental ball, the environment dynamically comes alive with sounds like bird chirping and wind, enhancing the sensory experience and underscoring the significance of gameplay milestones within the story. This deliberate use of sound contributes to the atmospheric immersion and narrative progression in Chroma Journey.

Chapter 5: Result & Evaluation

In this chapter, we present the findings obtained from the survey conducted to evaluate the implementation of atmospheric elements in Chroma Journey. We also discuss the testing process used to assess our design decisions and highlight the limitations of our study.

5.1 Survey Result

The survey conducted aimed to gather feedback and insights related to the research problem surrounding the impact of environment atmosphere on player engagement in video games. A total of 30 gamers participated in the Google Form survey, responding to specific research questions designed to assess their experiences and perceptions surrounding the impact of environment atmosphere on player engagement. The survey responses provide valuable quantitative and qualitative data that inform the evaluation of atmospheric elements and their influence on player engagement. Below are the question result:

1. How important are the following atmospheric elements in video games to you? (Rate on a scale from 1 to 5)

Atmospheric elements	Average rating from scale from 1 to 5
Visual aesthetics	4.7
Audio effects	5
Environmental details	3.8
Immersive qualities	4.5

Table 5.1.1 Average rating from scale from 1 to 5 of Atmospheric elements

The survey results indicate that participants consider audio effects to be the most important atmospheric element in video games, with an average rating of 5 out of 5. This suggests that sound design plays a crucial role in enhancing player experiences and immersion. Visual aesthetics also received a high rating, averaging 4.7, highlighting the significance of captivating graphics and art styles in video games. Immersive qualities, which likely encompass narrative depth and world-building, received a substantial average rating of 4.5. However, environmental details garnered a slightly lower average rating of 3.8, indicating that while important, participants may prioritize other atmospheric elements more strongly. Overall, these findings emphasize the multifaceted nature of the

atmosphere in video games and underscore the importance of audio-visual components in driving player engagement and enjoyment.

2. How engaged do you typically feel when playing video games with immersive atmospheric elements?

Average answer is 4.2

Which specific atmospheric features enhance your overall engagement in video games?

Atmospheric Enhancement	Average rating from scale from 1 to 5
Realistic graphics	4.1
Atmospheric lighting	3.8
Dynamic weather effects	3.2
Evocative sound design	4.4
Detailed environmental storytelling	4.1

Figure 5.1.2 Average rating from scale from 1 to 5 of Atmospheric Enhancement

The survey results reveal that participants find evocative sound design to be the most impactful atmospheric feature for enhancing engagement in video games, with an average rating of 4.4 out of 5. This underscores the critical role of sound effects and music in immersing players and creating memorable gameplay moments. Realistic graphics and detailed environmental storytelling both received high ratings of 4.1, suggesting that visual elements and narrative depth contribute significantly to player engagement. However, atmospheric lighting and dynamic weather effects garnered comparatively lower ratings of 3.8 and 3.2, respectively. Some participants highlighted the importance of audio and lighting in creating memorable gameplay experiences, while others emphasized the value of player-driven exploration in narrative storytelling, cautioning against excessive detail that could impede player agency and enjoyment. These insights underscore the nuanced preferences and varied impacts of different atmospheric features on player engagement in video games.

5.2 Testing and Feedback

In the testing and feedback phase of implementing atmospheric elements in my game development process, I encountered significant challenges, particularly with lighting settings. Despite recognizing the issues and seeking solutions online, many errors within Unity remained difficult to resolve efficiently. This often led to prolonged iterations in achieving the desired atmospheric effects, yet with persistent shortcomings. Time constraints limited my ability to conduct more in-depth research and practice to address these challenges thoroughly. As a result, the process of refining and perfecting the game's atmosphere was hindered by these technical obstacles and resource limitations. Moving forward, allocating more time for troubleshooting and skill development would be essential to overcoming these persistent challenges and achieving greater success in creating immersive atmospheres within the game.

5.3 Limitation

In reflecting on the limitations encountered during the implementation of atmospheric elements in my game project, several key issues emerged. First, the presence of numerous bugs within the game posed challenges to the overall experience and atmosphere. Additionally, the sound effects proved insufficient in conveying a sense of immersion, impacting the overall engagement of players. The use of low-polygon environments may have contributed to a diminished sense of immersion, highlighting the importance of optimizing visual elements for enhanced player experiences. Furthermore, difficulties in effectively presenting the game's narrative to players hindered storytelling and thematic immersion. Addressing these limitations would require comprehensive debugging, refining sound design, optimizing visual aesthetics, and enhancing narrative delivery to elevate the overall atmospheric quality of the game.

Chapter 6 Conclusion

6.1 Future Work

- Refinement of Atmospheric Design: Further research and experimentation can focus on refining the implementation of atmospheric elements in game design, particularly addressing challenges related to lighting, sound effects, and environmental presentation.
- Enhanced Narrative Integration: Given the importance of storytelling in atmospheric design, future work can delve deeper into methods for integrating narratives seamlessly into gameplay.
- User Testing and Feedback: Conducting extensive user testing and gathering feedback from players will be crucial for iteratively improving atmospheric design.
- Innovation in Audio Design: Addressing the need for more immersive sound effects, future work can focus on innovative approaches to audio design in games.

6.2 Conclusion

In conclusion, this thesis has explored the impact of environmental atmosphere on player engagement in video games, with a focus on crafting immersive gaming experiences within the puzzle horror and platform genres. Through a comprehensive review of literature and empirical research, key insights have been gained into the significance of atmospheric elements such as visuals, audio effects, and environmental storytelling in influencing player experiences and emotional responses. The survey results revealed that players highly value atmospheric elements like realistic graphics, evocative sound design, and detailed environmental storytelling, which contribute significantly to their engagement and immersion in video games. However, limitations in implementation, including bugs, inadequate sound effects, and narrative presentation challenges, underscored the complexities of integrating atmospheric elements effectively into game design. This research contributes to the broader understanding of game design principles and provides valuable insights for game developers seeking to optimize player experiences through atmospheric design. Future studies can build upon these findings to further

explore innovative approaches to crafting engaging and immersive game atmospheres.

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Appendices

Appendix A

Project Paper Consultation Logbook	
Project Title	Chroma Journey
Student Name	Wong Zi Ming
Student ID	2003878
Year/Semester	Year 3 Semester 2
Supervisor	Dr. Simon Ang Puan Nik Dr. Aloysius Yap Ms. Christie Chow

WEEK 01	
Comments: • Form a group in this week. • 2 GV and 2 GS was most preferred in a group. • Prepare the 2-game idea for week 2 consultation. • Prepare a proposal ppt slides with declaration for Week 3 presentation. • Avoid of sensitive theme in game idea. • Prefer idea relate to heritage and cultural or folklore and Myth. Others idea must get approval by supervisor.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**
WEEK 02	
Comments: • Second idea was interesting, prefer choose second idea for FYP. • Focus on one level but different endings. • Prepare mood board and concept art for the proposal presentation. • Try design the game idea with mix Chinese word with small English title. • Research topic: Relate to the game idea. • Must do high poly if choose second game idea.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

Figure 1.1 Logbook 1

WEEK 03	
Comments: • Game size control in 20gb. • For Graveyard Manager, the content lacks of culture of Chinese, the ghost might need to add more elements of Chinese culture and more variations of ghost. Also, it was expected that we would make our game a random gameplay experience to improve the game's replayability. • For Chroma Journey, can add in some Chinese culture for the game story, example as Chinese Zodiac as the ability for chroma or make the game collect the animal piece instead of seed. After that it was suggested to make the environment being take back the color level by level instead of everything at the last of the game to show the progression of the gameplay.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

WEEK 04	
Comments: • For the environment it was suggested that the environment changes at every start and end of the 4 area in the level so that the player has a clue if he or she have passed by a particular area of the level or not. • When showing the progression, better to visualize the idea, for example, game flow, level block out, and environment sketch.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

WEEK 05	
Comments: • Progression takes place, good start. • For the level design, avoid putting tutorials during the gameplay, include all the game mechanic tutorials only before the game actually starts. • For the game environment, just put the asset we have even though is just a dummy asset, because these can provide a simple idea of how our actual environment looks like so that the supervisor can have a better understanding and easier to give us feedback for us to improve.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

Figure 1.2 & 1.3 Logbook 2

WEEK 06	
Comments: • Progress on the path, good jobs for what is shown, and keep on putting in the same efforts. • Still not able to show the mechanic during gameplay, must be aware of this for the alpha test.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**
WEEK 07	
Comments: • Reminder when student try to do a game in a dark environment, make sure the contrast for the light in the game are very strong which create a high contrast duel that the lap projector may not be able to show. • Level could be more crisis for the player, don't let the player feel bored going through the environment with nothing is a threat to the player. • Make sure mechanics can show in the alpha demo.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

Figure 1.4 Logbook 3

WEEK 08	
Comments: • Might put some attention in designing the main character, do make the character look more friendly, and the color of character avoid use the aggressive color. • Lighting for first level is too dark, suggested maybe put some dim light or silhouette that at least show some shape for the character and environment. • Suggested make a throwable light sources that attach monster, this could make the game more playability. • For the milestone, is unclear being convey, better so specify the thing we plan to do, otherwise it seem like designer also not clear what he want to do and not planning well for the game.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

WEEK 9 (1)	
Comments: • Stay on the concept where what we propose, but can combine some of the concept of the new idea.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

Figure 1.5 Logbook 4

WEEK10 (2)	
Comments: • Can scale down the level don't throw away the level concept. • Put up the assets in the level 1, replace the placeholder with asset. • Better get each teammate to work on each level and integrate the work.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

WEEK11 (3)	
Comments: • Advise to update more using visual, too much of word and design document showing.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

Figure 1.6 Logbook 5

WEEK 12 (4)	
Comments: • Game Title Need to be enhance and more beautified • Add more detail in Level 2 • Continue work on the floating effect on water • Make the environment props have their own meaning, not just eyes saw.	**Supervisor signature:** 
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

WEEK 13 (5)	
Comments: • Focus more on level competition so that can see the game flow.	**Supervisor signature:** 
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

Figure 1.7 Logbook 6

WEEK 14 (6)	
Comments: • No consultation on this week	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

WEEK 15 (7)	
Comments: • No defend mechanics in second level, advise to be work on the idea that player can fight back the monster. • Environment for level 1 can hale more life to it where put the light can breathing and the fog is moving in the environment.	**Supervisor signature:** 
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

Figure 1.8 Logbook 7

WEEK 16 (8)	
Comments: • Can make the character intensity higher so that player can see the character or better outline. • More characteristic on the character.	**Supervisor signature:** 
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

WEEK 17 (9)	
Comments: • No consultation on this week.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

Figure 1.9 Logbook 8

WEEK 18 (10)	
Comments: • Good job on cutscene, can add a fade in and fade out effect on the load scene so it seem smoother. • Continue work on the game flow detailing.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

WEEK 19 (11)	
Comments: • No consultation on this week	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

Figure 1.10 Logbook 9

WEEK 20 (12)	
Comments: • Push up the detail then should be all right. • Better to see everything in one, combine in one. • Don't forget the environment changes in the game.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

WEEK 21 (13)	
Comments: • Sound effect need to redo because it was very bad. • Other than that just minor thing need to be follow up.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

Figure 1.11 Logbook 10

WEEK 22 (14)	
Comments: • Endgame cutscene no environment changes, add in the scene. • Sound effect still need to enhance. • For Level 3 puzzle , the boxes heavy cam base on the size of the box so it look more logic.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

Figure 1.12 Logbook 11

Appendix E

Final Project Title Form

Fill in the information below as detailed as you can after confirming project title.

Project Type:
☑ Product Based Project
☐ Research Based Project
(tick the appropriate box)

Student ID	Student Name	Email & Contact no
2003878	Wong Zi Ming	zimingwong2@gmail.com 01151284354
2100171	Ho Keen Mun	robect2@gmail.com 0162298270
2101503	Leong Wan Yi	leongwy1103@gmail.com 0178914905
2001345	Leong Xue Qian	qianxue.jane@gmail.com 01136618226

Supervisor: Dr. Simon & Puan Nik Norazira binti Abdul Aziz

Project Title: Chroma Journey The Last Guardian

Figure 2.1 Final Project Form 1

Project description: Chroma Journey is a 2.5D puzzle-platform horror adventure game with a Chinese cultural setting talking about the four auspicious beasts created the main character, Chroma as one of the guardians of the world to protect the east side seal of Four Fiends to keep the world peace. However, one fateful day, the seals of Azure Dragon were broken, unleashing the four malevolent beasts in the east. Therefore as the guardian, the player will control Chroma's step on the journey of seal reparation.

Student name	Individual Project Scope
Wong Zi Ming	Game Design, Level Design, Sound Artist, Environment Artist, Ui function, Character Design, 3D Modeler, Load scene function.
Ho Keen Mun	Sound Artist, Character Design, 3D Modeler, Animator, Poster, Game Teaser.
Leong Wan Yi	Player Movement Programming, Visual effects, Ui Function, item interactor, Environment Changes Function.
Leong Xue Qian	Enemy AI, Game Mechanic Programming, Main menu function, Sound Trigger Fuction.

Figure 2.2 Final Project Form 2