ENVIRONMENTAL FLUCTUATION: PLAYER AWARENESS AND ADAPTABILITY IN PLATFORM ADVENTURE GAME

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Declaration of Originality

I, Leong Xue Qian, declare that this research paper entitled “Environmental Fluctuation: Player Awareness and Adaptability in Platform Adventure Games” is solely based on my original work except for the citations that have been acknowledged. 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 Science (Honours) Game Development, under the Universiti Tunku Abdul Rahman.

Leong Xue Qian

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List of Terminology

Terminology	Description
2D	Two-and-a-half Dimensional
3D	Three Dimensional
AI	Artificial Intelligence
FYP	Final Year Project
GDD	Game Design Document
GS	Game Designer
GV	Game Developer
HUD	Heads-Up Display
NPC	Non-Player Character
OS	Operating System
PC	Personal Computer
RO	Research Objective
RQ	Research Question
UI	User Interface
USP	Unique Selling Point
VFX	Visual Effect

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Chapter 1: Introduction and Overview

This research paper was written for the UJMZ32010 course by Leong Xue Qian, 2001345. This paper will discuss the game the group worked on for two semesters as part of their Final Year Project (FYP). Chapter 2 explores the literature to comprehend the findings of earlier studies linked to the author's research topic of "Environmental Fluctuation: Player Awareness and Adaptability in Platform Adventure Game." The following chapters will cover the research methodology, results, and discussion.

First of all, PolyMasters, a four-person development team, was formed for the Game Studies FYP. There are two game developers (the author, Leong Xue Qian, and Leong Wan Yi) and two game designers (Ho Keen Mun and Wong Zi Ming), with the developers working on programming and the designers working on design and art.

Besides, Chroma Journey: The Last Guardian (Chroma Journey) and Graveyard Manager are two game ideas that have been presented. After careful review and discussion, Chroma Journey has been chosen for the future development in view of members' experience and increased interest in a revised game concept.

The second proposal, Graveyard Manager is a 3D first-person perspective horror game where the player plays as a cemetery caretaker facing supernatural disturbances. As the player, you need to exorcise the restless spirits and survive. In the game, the player will take on the role of Ming, a destitute youngster, doing the cleaning chore and will be provided visual cues as time passes. It is crucial to choose wisely and exorcise the right grave because the player's choices will determine three different outcomes.

Additionally, the proposal slides have been included in Appendices B for Chroma Journey and C for Graveyard Manager.

1.1 Game Introduction

Like Little Nightmares, Chroma Journey is a 2.5D platform adventure game. As the four Auspicious Beasts created Chroma, the player will take control of this guardian, who must reveal the evil existence of the Four Fiends to bring peace back to the planet. The game's goal is to have the player explore intriguing landscapes, solve puzzles, and navigate shadowy areas to reclaim the power of The Four Auspicious Beasts and reseal The Four Fiends.

1.2 Game Objective

The player's task is to complete the obstacle puzzles and collect the element balls while escaping the Four Fiends along the way. As a result, players must carefully consider how to manage their resources and ensure that they collect the element balls from the seal stones along the way and recharge the element balls to fill the seal at the end.

1.3 Game Genre

There are several game genres available on the market, Table 1.1 shows the genre that Chroma Journey has integrated.

Genre	Description
Adventure	The player will have to explore the surroundings to gather hints to solve the puzzles or escape from the fiends. Players must be aware of these sensory shifts in order to adjust their playing style. The surroundings will change and will mostly be indicated by visual or auditory clues.
Platformer	The game features a 2.5D side view and requires player to utilize platforming skills to progress through each level.

Table 1.1: Game Genre

1.4 Game Story

The world was once at peace when the Four Auspicious Beasts, Azure Dragon, White Tiger, Vermilion Bird, and Black Tortoise sealed the Four Fiends, Hundun, Qiongqi, Taotie, and Taowu. They made Chroma a seal guardian to protect the seal. However, on a tragic day, the Azure Dragon's seals were crushed, letting the four evil beasts loose in the east. Faced with this catastrophe, Chroma sets out on a quest to reseal the ancient threats and restore world balance. Figure 1.1 shows the initial Chroma sketch.

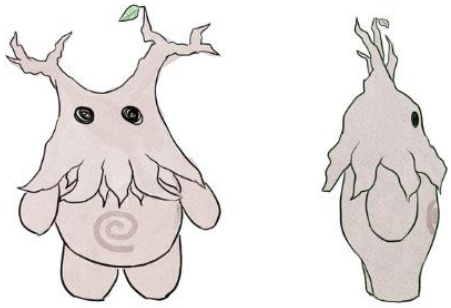

Figure 1.1: Chroma – Initial Character Sketch

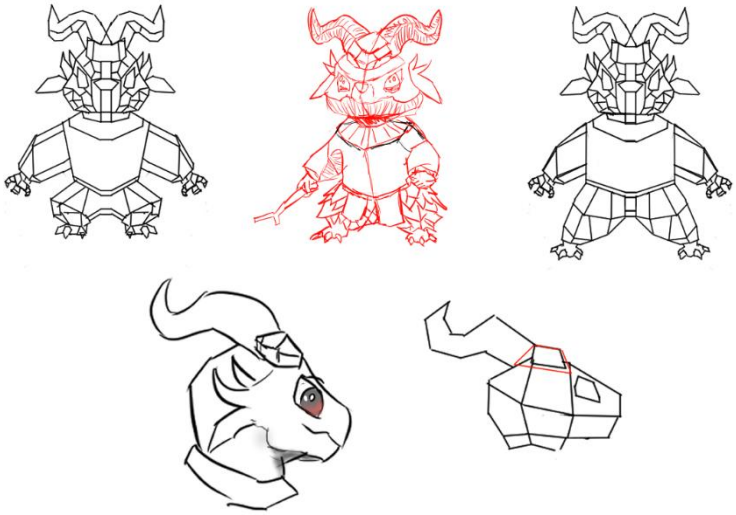

Figure 1.2: Chroma – Final Character Sketch

Since the figure was set as a Chinese mythology guardian, the final sketch displayed in Figure 1.2 has adjusted Chroma to be more Chinese in style, with some Asian Chinese Emperor outfit features.

The Four Fiends each have their own personality and will react to different stimuli. Table 1.2 shows the Four Fiends' characteristics, which will be used in the puzzle design.

Fiends	Description
Qiongqi	The sound thief, stole the voices of the forest creatures, rendering them silent.
Taotie	The ravenous, consumed everything in its path, devoid of life in the deep woodlands.
Hundun	The embodiment of chaos, snatched the sunshine, throwing the earth into endless darkness.
Taowu	The color thief, emptied the planet of its vivid hues.

Table 1.2: Fiends and Its Characteristics

1.5 Art Style

The game will feature low polygonal graphics and a flat-colored environment. Figure 1.3 shows a game with the aforementioned settings.

Figure 1.3: Journey’s Gameplay Scene

Journey is a well-recognized indie game that excels at providing an immersive experience with its expressive visuals and audio design. Journey, with its low polygonal graphics and flat-colored landscapes, skillfully evokes a sense of wonder and immersion in the player. This is what Chroma Journey should learn from and apply.

1.6 Unique Selling Point (USP)

Games will usually feature a few USPs that set them apart from other published games. Table 1.3 displays Chroma Journey's USP.

USP	Description
Game Concept	Chinese mythology holds that there are two types of energy: positive and negative. These energies are always connected and generate harmony or balance. This game uses two sets of characters to symbolize the energy above: Four Auspicious Beasts stand in for the protector and fortune, while the other set, known as the Four Fiends, will act as the opposing negative energy, symbolizing the difficulties and barriers. In contrast to the more popular auspicious beast, the game concentrates more on the Four Fiends in an effort to educate the players about the idea that, in Chinese mythology, opposing forces always work together to maintain the world equilibrium.
Game Theme	The game's theme will incorporate characters from Chinese mythology such as Hundun, Qiongqi, Taotie, and Taowu. This distinguishes the game from other Western mythology games.
Unique Gameplay Mechanic	The game will be integrating the features of these Four Fiends. The player must be aware that they have entered a different Fiend's area and act appropriately to keep from being discovered. This dynamic gameplay system will keep players engaged and challenged as they progress through the game's diverse environments.

Table 1.3: USP

1.7 Target Market

The target audience will be players over the age of 13. According to Sapieha (2017), Little Nightmares has an age classification of 13 and above. 23 parents also agreed that the game is suitable for children above the age of 13. The above figures support Chroma Journey's target age group of 13 and above, as both games used the same design concept.

Furthermore, the target audience could be players who are interested in Chinese mythology. It is typical for games to use mythology, either as inspiration or as gameplay, but this is most commonly seen with Greek and Japanese mythology. The mythology of China was never given much attention (Wilson. 2022). Among the many fanciful monsters it contains, Chroma Journey introduces the Four Fiends, who integrate into the level element to create a unique challenge.

1.8 Market Research

There are games that compete Chroma Journey on the market, possibly because of their same gameplay or art style. Table 1.4 shows the competitor of Chroma Journey.

Competitor	Description
Journey	Limbo is well-known for its expressive visuals created by its low polygonal graphics and flat-colored environment. Chroma Journey likewise plays with the same settings, while Journey is already a popular game on the market.
Little Nightmares	Little Nightmares' puzzle design perfectly blends with the game's superb platforming and spooky setting. Players were frequently placed in a depressing state because they had no idea what was ahead. Following its sixth anniversary of release, the game's publisher stated that it had sold 12 million units, indicating the game's success (Allen, 2023).

Table 1.4: Chroma Journey’s Competitor

1.9 Game Mechanic

With Four Fiends as the core game concept, each with distinctive traits, a variety of mechanics have been incorporated. Table 1.5 outlines the game mechanics.

Mechanics	Description
Checkpoint	Checkpoints are usually set up at the beginning of each level and will be triggered once the player reaches the corresponding game marker. If the player dies during the story, he will respawn.
Interact	The player can push various items to solve puzzles and clear the path.
Pickup	The player must collect element balls along the path and recharge them at the final level to seal and win the game.
Player Movement	The player can walk, run, jump, climb, crouch, and swim.
Sound Mechanic	The sound intensity varies with the player's movement, which will thereby draw the attention of sound-sensitive monsters. Intending to advance with minimal noise, player must assess the game's surroundings. (Specifically made for the Qiongqi Level)
Stamina System	The player's ability to run, jump, climb or swim, correlates with stamina. Stamina rises when strolling or at rest and it drops when moving. Resting will lead to quicker restoration than movement. (Even though the stamina system is used in all levels, it was designed specifically for the Taotie Level)
Throw	The ability to toss light ball will aid the player in distracting monsters. The player may navigate the level without needing any light as a result of the light ball's illumination. Given Hundun's great sensitivity to light, this can save the player from being attacked. (Specifically made for the Hundun Level)

Table 1.5: Game Mechanics

1.10 Hardware and Software Requirements (need to refine for software)

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

Hardware

Table 1.6.1 is a list of the hardware utilized on the player side and during development.

Development Hardware		Recommended Player Hardware
Windows 10 & above	Operating System	Windows 7 & above
Intel(R) Core(TM) i7-9750H, 2.60GHz or AMD Ryzen™ 7 4800H, 2.90GHz or higher	Processor	Intel Core2 Duo E8400, 3.0GHz or AMD Athlon 64 X2 6000+, 3.0GHz or higher
8 GB	Memory	4 GB
GeForce GTX 1660Ti	Graphics Card	GeForce 9600 GT
20 GB	Storage	10 GB

Table 1.6.1: Hardware Requirements

Software

Table 1.6.2 is a list of the software utilized during development.

Software	Description
3ds Max	Used for modelling, rigging, and texturing
Blender	Used for modelling
Discord	Used as a meeting and artwork uploading tool
GitHub	Used as a collaboration tool to coordinate updates
Google Docs	Used as a writing tool for Game Design Document (GDD)
Photoshop	Used to design the game poster and logo
Premiere Pro	Used to create the cutscenes and game trailer
Unity Game Engine	Used to develop the game. The chosen version is Unity 2022.2.1f1.
Visual Studio 2022	Used as a scripting tool
WhatsApp	Used as the main communication tool

Table 1.6.2: Software Requirements

1.11 Budget

Since the team has two designers on staff, there is no cost to acquire online content like music and animation. Additionally, the team does not have to pay any fees to access tools such as GitHub, Unity, and many more shown in Table 1.7 because there are specific designed packages available for students to subscribe to. However, a mandatory printing charge of RM 950 is required.

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
	Blender	3	0.00
	GitHub	-	0.00
	Premiere Pro	2	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
	WhatsApp	-	0.00
Miscellaneous	Printing	4	800.00
	Promotional Material	1	150.00
		Total	950.00

Table 1.7: Budget

1.12 Schedule

For the entirety of FYP1, the team will concentrate on game design and planning, as indicated by the FYP1 timeline in Figure 1.4.1. The team will at least finish character design, create a draught level design, and program tutorial level content such as player movement and puzzle elements.

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 1.4.1: FYP1's Gantt Chart

The team will continue working on the game and release a playable beta version by the time the schedule shown in Figure 1.4.2 for FYP2 is completed. This will include completion of the game's mechanics and environment.

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 1.4.2: FYP2's Gantt Chart

1.13 Project Scope

Referring to Table 1.8, the team consists of two game designers (GS) and two game developers (GV). Each of them is in charge of overseeing the art assets, player-related user interface (UI) and behaviors, puzzle mechanics and enemy artificial intelligence (AI), and, finally, the game and level design. Furthermore, each member will have their own research focus area, which they will incorporate in the game to improve the player experience.

Name	Role	Research Topic
Ho Keen Mun (GS)	– 3D Artist – UI Designer	Texturing to Create Realistic Low Poly 3d Models
Leong Wan Yi (GV)	– Character Programmer – UI Programmer	The Impact of Non-Diegetic UI Design on Player Experience in Adventure Games
Leong Xue Qian (GV)	– AI Programmer – Gameplay Programmer	Environmental Fluctuation: Player Awareness and Adaptability in Platform Adventure Game
Wong Zi Ming (GS)	– Game Designer – Level Designer – Sound Engineer	Impact of Environment Atmosphere on Player Engagement

Table 1.8: Member Scope

The brief project scope is displayed in Table 1.9, which includes information on the number of levels, game concepts, and game assets in the game.

Scope	Description
Level	There are five levels in total, including a tutorial level where the game begins.
Game Concept	The game concept will revolve around the Four Fiends (Qiongqi, Taotie, Hundun, and Taowu). Each level will use one of these Fiends' traits to build the level and create the mechanism. The level concept and Fiend will be listed as follows: • Qiongqi – Sound • Taotie – Theme of Death • Hundun – Light • Taowu – Color
Level Design	To express the Fiends' traits, the level will be built separately to the extent that suits the game concept. The level design or setting related to each Fiend will be listed as follows: • Qiongqi – Forest • Taotie – Lake • Hundun – Cave • Taowu – Cave
Game Asset	PolyMasters generated all of the assets required for the game, including the rock, tree, enemy character, and player character.

Table 1.9: Project Scope

1.14 Summary

The four-person group PolyMasters proposed two game ideas in the early stages of development with the intention of meeting the FYP course requirements, and one of them, Chroma Journey, was chosen. In brief, Chroma Journey is a 2.5D puzzle-platform horror adventure game developed with the Unity Engine. The player assumes the role of Chroma, who must solve all the puzzles and uncover the plot while travelling to reseal the Four Fiends.

As regards the project scope, the four members will contribute to the artistic and technical development of the games, including level design, art assets, artificial intelligence, and producing a beta version that can be played. Each member will also focus on their particular research area and work to incorporate the best findings from each study into the final product.

Chapter 2: Background Study and Literature Review

This chapter covers a background study and a review of relevant works to the research topic "Environmental Fluctuation: Player Awareness and Adaptability in Platform Adventure Game". The purpose of the author's secondary study is to pinpoint the research gap and lay the groundwork for future studies.

2.1 Introduction

Platform adventure games typically have a large number of levels or areas, each with its own set of platforming challenges and exploration opportunities. Thus, level design is vital since it engages the player. A poor level design can make a game feel monotonous, whereas a good level design can provide an entertaining experience. However, a proper transition between areas is particularly crucial because it can either enhance or break the game flow, depending on how it is handled. In this case, the player's awareness is playing a crucial role in providing an optimal gaming experience.

This chapter will only discuss how environmental changes can aid in raising the player's awareness. The visual and aural cues will provide the player with some hints that the region is changing, alerting the player to use a different playing style and smoothing the game flow. With these indications, the player is anticipated to be able to react to various fiends using various techniques.

2.2 Problem Statement

Platform adventure games frequently rely on giving players a sense of progression and challenge. Players will feel engaged as they confront more challenging tasks and discover new mechanics. As a result, fresh gameplay elements or themes will be introduced for different stages to avoid the player feeling bored with the game. The addition of these fresh challenges to the game not only makes it more appealing but also keeps players interested and involved.

However, if the game lacks smooth transition, for example, between themes, player may notice abrupt style changes, disrupting flow and immersion. Consequently, creating challenging games without undue interruptions requires a thorough understanding of how players perceive and react to environmental changes. Aiming to enhance game design and overall gaming experience, this research investigates the effects of environmental fluctuations on player awareness and adaptability in puzzle adventure games.

2.3 Research Objectives

Limited insight into players' understanding of game transitions is a research gap that must be filled. This study attempts to close the gap by exploring how players pick up on and adapt to changes in the game since smooth transitions within a gaming environment enhance player experience. In order to help with the subsequent investigation, two research objectives have been formulated.

RO1: Investigate the Impact of Environmental Changes on Player Awareness

RO2: Examine the Impact of Environmental Cues on Player Adaptability

2.4 Research Questions

Two research questions have been formulated in response to the research objectives. These questions could aid in research planning and ensure that the project focuses on what the author wants to learn.

RQ1: How does environmental changes impact players' awareness during game?

Distinct areas in a game demand specific strategy, making player awareness of area transitions vital. Environmental changes can be effectively conveyed through strategic placement of visual or aural cues.

RQ2: How do environmental cues impact players' adaptability during gameplay?

It is crucial to investigate whether cues at area transitions are successful in alerting players to adjust their gameplay.

2.5 Literature Review

In Greater China, folktales, religious tradition, and cultural history have been transmitted orally or in writing for generations, forming the foundation of Chinese mythology. These narratives give rise to numerous mystical creatures, each with its own backstory, and some are even supported by historical evidence. In Chinese mythology, the four creatures that are considered auspicious are commonly referred to as Four Symbols. They are the Azure Dragon, Vermilion Bird, White Tiger and Black Tortoise which protecting the East, South, West and North respectively. These four creatures are said to represent a direction, season, or element. With each of these creatures possessing stronger strength in particular areas and providing distinct good meanings, they all have a positive effect that is thought to bring good luck and wealth (Raalte, 2023).

However, in Chinese culture, anything positive invariably has an opposing evil force. They are referred to as Hundun, Taotie, Taowu, and Qiongqi, the Four Fiends as shown in Figure 2.1. An overview of the Four Fiends and how their traits relate to the game element are provided in the following section.

Figure 2.1: Illustrations of Four Fiends

2.5.1 Four Fiends

According to Zuo Zhuan, tribe rebellions were rife before the Huangdi united ancient China. During Emperor Yao's reign, four recalcitrant tribe leaders, Gonggong, Huandou, Gun, and Sanmiao were exiled for their resistance to his reign. Following their deaths, they reappeared as the "Four Fiends", with Gonggong taking on the form of the qiongqi, Huandou the hundun, Gun the taowu, and Sanmiao the taotie (Ip, 2023). It is thought that the four leaders take on these forms because the tribes sculpt these chimerical creatures on their totems as a sign of respect.

According to Chinese mythology, the Four Fiends are distinct entities that each represent evil forces capable of overturning the natural order of the universe. These fiends have always revolved around the issues of human nature, and their traits best describe the vulnerabilities of humanity. The following section illustrates the traits of the Four Fiends, which will later be used to demonstrate their connection to gaming aspects.

2.5.1.1 Hundun

According to Shenyijing, hundun is faceless and has eyes that cannot see, ears that cannot hear, a torso with no organs, and an intestine that cannot digest. Though there are many differing opinions regarding its appearance, its resemblance to a dog—petite, coated in long fur, and on all fours, is arguably the one unquestionable feature. The most renowned mythological version depicts it as the state of primordial chaos before Heaven and Earth parted. As it was described, hundun behaved like pure chaos, upsetting the morally upright and allying with the dishonest. As a result, it is commonly used to characterize those who are unable to distinguish between right from wrong (Ip, 2023). Furthermore, there is a version that claims humans are incapable of seeing or hearing from hundun.

2.5.1.2 Taotie

Taotie is described as a creature with human faces, sheep bodies that had eyes below the armpits and an infant voice. Readers who are familiar with China's characters can infer with ease that taotie enjoys eating. There is a tale saying that everything is eatable in the eye of taotie, and this is the reason why at the end taotie died because of overeating. Taotie was therefore used to describe those who were greedy and rapacious.

Figure 2.2: Ritual Bronze Vessel with Taotie Motif

In addition, taotie was traditionally incorporated in Chinese history into ceremonial bronze vessels with the motifs of bodiless beast heads as seen in Figure 2.2. There has been a lot of debate on the interpretation of the motifs, but the academics believe that it is a messenger who connects the tribal population with the supernatural (Ip, 2023).

2.5.1.3 Taowu

In historical records, taowu has less detailed information compared to the other three fiends. The details mostly revolve around its appearance and personality. It is described as a tiger covered in dog fur, with a pair of protruding boar fangs, and an elongated tail. There are two versions of its personality, but they convey a similar idea. Shenyijing portrays taowu as arrogant and hard to control, using the terms "aohen" and "nanxun." Zuo Zhuan sees stubbornness as its weakness, likening it to people who stick to their own path despite advice and criticism.

2.5.1.4 Qiongqi

Unlike taowu, qiongqi has more records, but there are two different versions. According to the Classic of Mountains and Seas, people in the Shaanxi area believe qiongqi to be a winged tiger. However, in Mongolian tales, it is seen as a demon with the body of a cow and the spikes of a hedgehog. This mythical creature is said to hover around places of conflict and is rumored to swallow the nose of a righteous party (Ip, 2023). In ancient Chinese culture, qiongqi was used to describe individuals who were far from being a gentleman and closer to being a villain.

2.5.2 Four Fiends in Level Design

As was indicated in the previous section, the Four Fiends will be included in the level design. Four levels would exist, and each would apply the traits of the Four Fiends. Players will need to use various strategies or abilities due to their unique characteristics in order to finish the level. As a result, it is critical for the players to recognize that the environment is changing. Here is where the transition technique is demonstrated; often, it involves the placement of either visual or auditory clues. These are the two tips that the majority of games use to enable players to navigate the game with ease.

2.5.3 Transition Technique

Transitions and interruptions are common in games because they try to provide diversity, tension, or feedback to players. With the knowledge that overuse can lead to boredom or disengagement, this section sought to examine how to build smooth transitions. There are two approaches. The first is to make them seamless by employing contextual signals, sound effects, or animation rather than a quick fade to black message; this flow will not break the game feel but will enhance the game experience. The alternative is to make the transition meaningful and related to the game's emotions. Lighting or music changes, for example, can be utilized to show the adverse effects of the players' choices (Game Design, n.d.). These are cues.

Cues are in-game events that prompt the player to do something, act in a certain way, or make a decision. It assists players in knowing what should be done, and as a result, players will build habits that they can easily recall without much thought when the same situation arises (Romoslawski, 2021). While cues in a game setting can take many different forms, such as colors, cut scenes, music, or graphics, they often fall into two primary categories: visual cues and aural cues.

2.5.3.1 Visual Cues

Visual cues in games are typically elements inside the game world or interface that can visually communicate information to players. They might be static or dynamic, but both are intended to encode awareness information in a manner that players can easily understand. For example, text, animations, and color changes might transmit game-related information such as health conditions or game objectives. In general, visual cues are critical and the simplest approach to notify the player of certain facts and push them to make decisions as needed.

Visual Cue	Description
Animation and Effects	Draw attention to important elements, indicate the availability of interactions
Textual Cues	Text overlays or embedded text within the game environment
Dynamic Visual Cues	Cues vary in reaction to player actions or game events, such as changing colors and lighting up.
Lighting and Focus Cues	Lighting manipulation can direct the player's attention to specific places, items, or paths.

Table 2.1: Type of Visual Cues

2.5.3.2 Aural Cues

Aural cues are ambient sounds or music changes that correspond to specific locations, events, or puzzle states inside the game environment. For example, as the rock falls, a sound will be played in conjunction with the animation.

2.5.4 Review Outcome

When the visual and audio cues work together, they can improve the game feel. As a result, Chroma Journey will use a few of the cues indicated above, including animation and effects, dynamic visual cues, lighting and focus cues, and two types of audio cues.

Chapter 3: Research Methodology

This research will employ a mixed-methods approach, analyzing and collecting both qualitative and quantitative data in the form of questionnaire. The effectiveness of the environmental cues in conveying information and alerting the player to perception will be assessed using a dichotomous question and rating scale, while the inclusion of open-ended questions will allow for an analysis of whether the chosen approach will actually increase player awareness. This will yield research findings about player awareness, player response, and environmental cues that can be used as a basis for further studies in the future and, ideally, as evidence for the data.

3.1 Sampling

In this study, the convenient sampling approach is employed, as it is the simplest method for the researcher to implement given the short timeframe and huge participant population needs. It is considered the ideal approach as it is the most cost-effective and efficient, requiring random people to sign up as volunteers.

Owing to the time constraints of only conducting a playtesting session lasting one or two weeks, the sample size was set at 50 participants, with a focus on young adults aged 20 to 29. This target demographic was chosen since there are many potential participants from this age bracket at the university where the author studies. In addition, as the research is centered on how players perceive the information, participants are not required to possess any gaming expertise or knowledge, which makes recruiting potential participants easier.

3.2 Scope

The scope was left open with the expectation that it could extend out as much as possible because a large number of participants would be necessary to produce clearer and more accurate results. To achieve that, a beta version of the game will be posted on social media, and the public will be invited to playtest it. Ideally, the public will return the questionnaire with some input.

3.3 Measurement Instrument

The questionnaire will be created using Google, and hence all data from the survey will be collected using Google Forms. Google Forms is used due to accessibility, as everyone is able to access Google Forms via their smartphones. Google Forms is also used due to its ease of use when making survey forms.

3.4 Research Flow

Figure 3.1 illustrates the research flow from the beginning of the literature evaluation to the finish of formulating the research conclusions to guide future research.

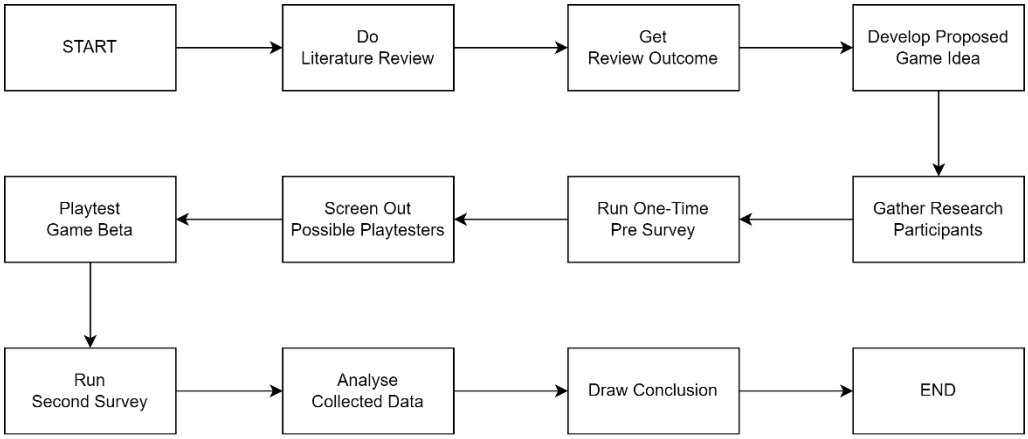

Figure 3.1: Research Flow

The part of the research where game improvements were made, and a second playtest was requested were excluded from this research owing to time limitations and the significant work necessary to update all of these visual and audio cues. However, all of the playtesters' feedback will be recorded and used for developing future game ideas in order to improve the player's immersion and sensory experience.

3.5 Research Design

3.5.1 Survey Design

A one-time pre-survey intended to distinguish those who find flat-color unpleasant from those who do not. Along with the participants' likelihood of playing a flat-color game, the questions also ask about their demographics. There will be a combination of multiple-choice and open-ended survey questions. To facilitate future data analysis, those who do not fall into the target age group will also be disqualified from the following round.

In an effort to investigate RQ1 and RQ2, a second survey has been created for participants to complete at the conclusion of the game. In order to better understand how players respond to changes in the game, the author intends to look at whether environmental adjustments can improve player awareness. The questionnaires will be included in the appendix section.

3.5.2 Procedure

Upon registration, participants are first required to take a one-time pre-survey. Participants who enjoy flat-color games will continue with the study after registering and being screened to remove those who find flat-color uncomfortable. After that, participants will be able to play a beta version of the game. Following the play session, participants will be asked to complete a second survey in which they will be asked to rate how much they feel that environmental cues affect their awareness and whether this can lead to an improvement in their response.

3.6 Limitation

There are several limitations that constrained the research as shown in Table 3.1.

Limitation	Description
Limited Playtester Network	With only a degree under her belt, the author finds it difficult to publicize the game, encourage more people to complete the survey, and contribute to the development of a more robust data research product.
Participant Comprehension Constraint	Since there is no requirement for the participants to have any experience with gaming, it is possible that they misinterpreted the task since they are not familiar with game philosophy or playtesting.
Restricted Age Group Sampling	The playing behaviours of different age groups will vary. The accuracy of the data may be affected because only one age group was focused on and other age groups, such as middle-aged people and the elderly, were left out.
Time Constraints	The playtesting sessions lasted only one or two weeks, which was insufficient time to gather enough data for a comprehensive research outcome.

Table 3.1: Research Limitation

3.7 Summary

Convenient sampling is employed due to its cost-effectiveness and simplicity, with the participants are mostly drawn from the author's immediate surroundings. After the participants have finished the game, the data will be gathered via a questionnaire that includes open-ended, dichotomous, and rating scale questions. In conclusion, the study was impeded by a small pool of volunteer testers; however, the author hoped that by releasing the game's beta on social media, more people would participate and contribute solid data for later research.

Chapter 4: Functional Specification

This chapter covers the functional specification of Chroma Journey, including game concepts, mechanics, control, and gameplay features.

4.1 Game Concept

Chroma Journey consists of one tutorial level that leads to four levels which employ various Fiends' characteristics. The game concept of each level is shown in the Table 4.1.

Level	Description
Tutorial	In this level, the player will be guided through game controls and important game mechanics such as collecting element ball (a key game component for resealing the Four Fiends).
Forest	This level's concept is about sound. The player will feel a transition from gentle ambient sound to quiet, indicating that the Fiend is progressively removing the world's sound component. When the player approaches the element ball, the sound will be audible.
Lake	This level goes into the theme of death, as the Fiend sees everything as eatable. The environment will change from a living to a dead woodland. Once the element ball is retrieved, the death forest will be restored.
Cave	In this level, the game's central element is light. There will be several clones on the map that prevent the player from passing through the level. The only method for distracting the clones is through light. Once the element ball is acquired, the fog will dissipate and the player's view will improve.

Boss	This will be the final level, and it revolves around colour. To reseal the Four Fiends, the player must return the collected element balls to their rightful places. Once the level is finished, the colour will be restored and the game will be completed.

Table 4.1: Level Concept

4.2 Game Control

Chroma Journey uses both keyboard and mouse input for gameplay. The available control inputs are listed below in the Table 4.2.

Control	Input Key
Move Left	A
Move Right	D
Move Forward	W
Move Backward	S
Climb	B
Crouch	C
Jump	Space
Recharge Element Ball	Hold F
Run	Hold Left Shift
Throw Light	Release Mouse Right Click
Pause Menu	Escape

Table 4.2: Game Control

4.3 Game Mechanic

Some mechanisms are specifically designed for a given level, even if they are used in another level. Table 4.3 displays the mechanics for various levels.

Level	Description
Forest	Since this level revolves around sound, players must be careful with their movements. The game's sound system is designed to resemble the real environment; it is evident that sprinting produces more sound than walking. As a result, players must take caution when approaching enemy clones in the level.
Lake	This level contains a lake that the player must pass through. The stamina mechanism was specifically built for this level to raise the level of difficulty. When a player wants to escape from an enemy, they must also consider their stamina and respond accordingly to complete the level.
Cave	The light mechanism was designed especially for this level because it revolves around light. As a result, if there are too many enemy clones obstructing the path, the player will need to throw a light ball to distract them.

Table 4.3: Game Mechanic

4.4 Game Guide

Most games have guides that explain what actions the player can take. It may not have directly instructed players on how to play the game, but it did guide them on what could be done. The gameplay experience may be improved by being aware of the goal or mechanics of the game.

4.4.1 Tutorial Guide

The player will be walked step-by-step through every general game control and mechanic in the tutorial level, from basic movement control to more complex developed controls like swimming. A tutorial text that explains how to use the game control will appear at the bottom of the screen as soon as the player approaches the triggered area, as shown in Figures 4.1 and 4.2.

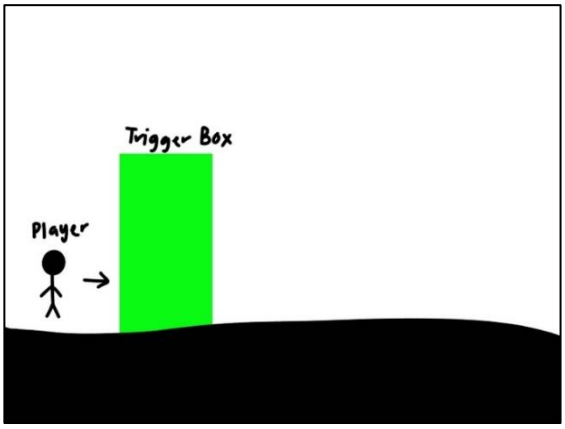

Figure 4.1: Sketch of Tutorial Guide Trigger Area

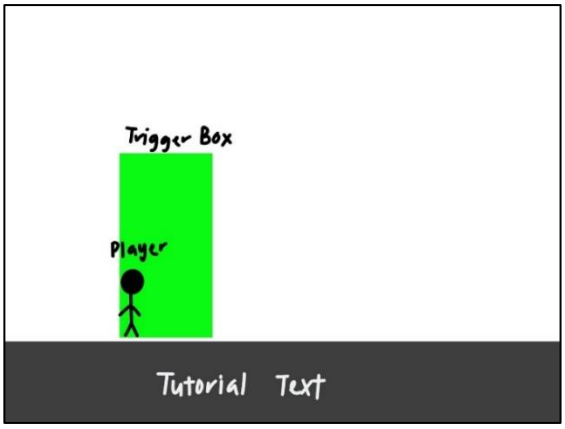

Figure 4.2: Sketch of Triggered Tutorial Guide

4.4.2 Stamina System

The stamina system is the most fundamental feature of the game at all levels, but it is specifically created for the lake level because this mechanic may disrupt the gameplay. To keep their stamina from running out and placing them at risk of death, players must make smarter decisions about when to perform specific actions.

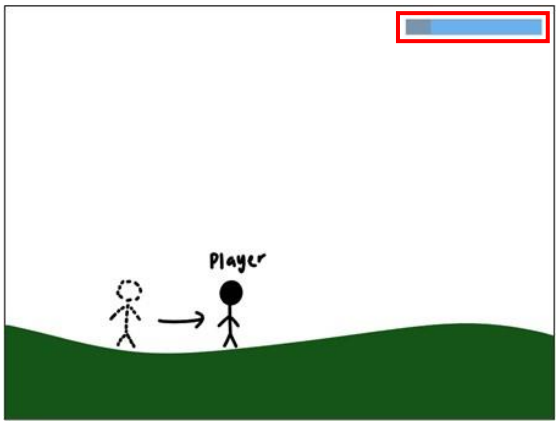

Figure 4.3: Sketch of Stamina Bar

4.4.3 Element Ball

Chroma Journey revolves around these element balls. The player's goal is to collect all of the element balls scattered across several levels and return them to their rightful place to fix the broken seal. For example, when a player collects an element ball, the element ball icon will appear in the top left corner, as illustrated in Figure 4.5.

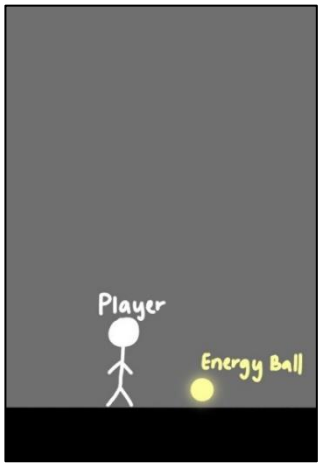

Figure 4.4: Sketch of Collecting Element Ball

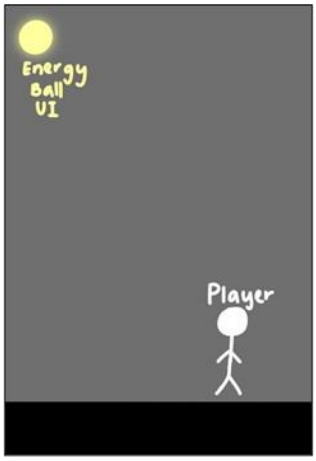

Figure 4.5: Sketch of Collected Element Ball

4.5 Summary

This chapter introduces game control and game guides. In addition, Chapter 4 covered the fundamentals of the game, including how each level works and which systems are designed specifically to interfere with gameplay. Later in Chapter 5, the game design of each level will be discussed in relation to the Four Fiends' traits.

Chapter 5: System Specification Design & Implementation

This chapter covers the system specification design and implementation of Chroma Journey that related to the research topic, Environmental Fluctuation: Player Awareness and Adaptability in Platform Adventure Game. The primary focus of this chapter will be on how visual and aural cues might convey environmental changes that may influence player awareness to change their gameplay style.

5.1 Design Concept

Environmental changes will be displayed as visual and audio cues to examine player awareness and adaptability. As an illustration, consider cues like ambient sound, visual effects (VFX) and cutscene. The design concept will be shown from one level to the next in the section below, using a top-down level sketch to introduce where and how the cues come into play.

5.1.1 Forest Level

Qiongqi was once claimed to enjoy hovering about sites of conflict, which involves a lot of sound or noise, thus Chroma Journey used this as inspiration and tied it to the game's sound system. In general, the game concept for this level, regarding the Fiend, Qiongqi, will revolve around sound.

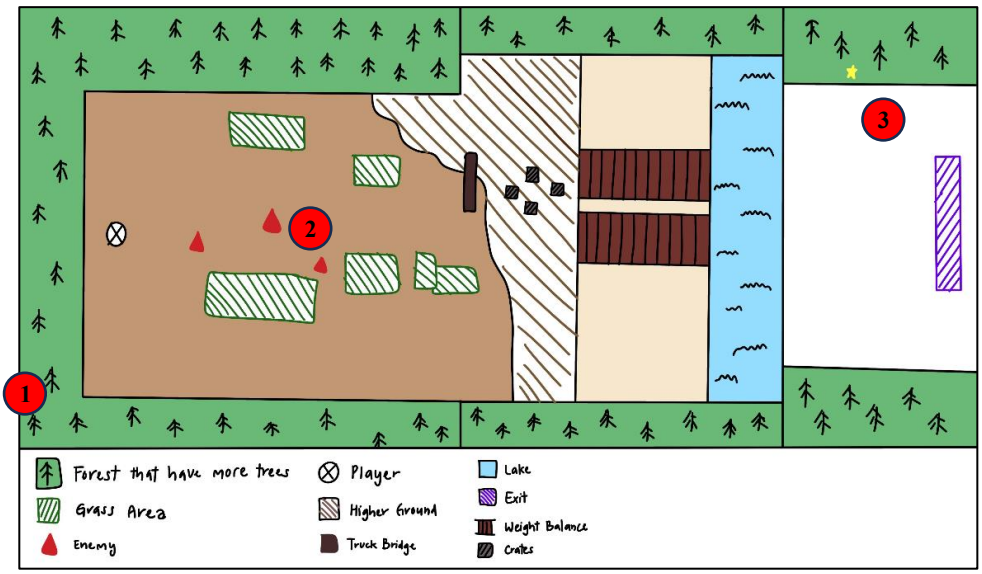

Figure 5.1: Forest Level Design Sketch

To emphasize the importance of sound in this level, players will notice a change from soft ambient sound in the tutorial level to silence while entering the level (marked with ① in Figure 5.1).

To illustrate that there is actual sound in real life, there will be leaves falling and wind VFX covering the entire landscape, indicating that there is wind blowing, and the player should initially hear the wind sound.

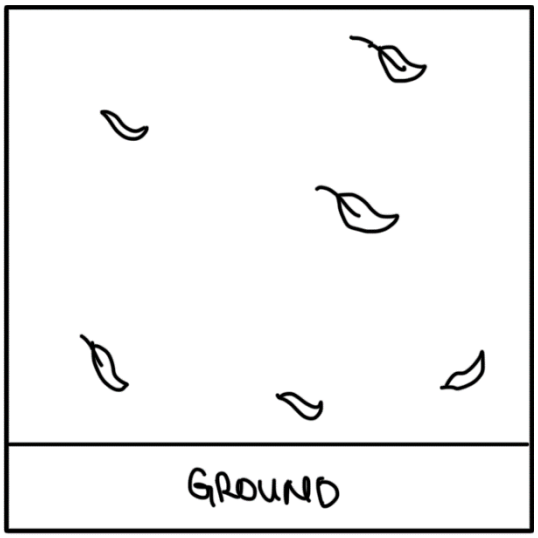

Figure 5.2: Leaves Falling Visual Effect Sketch

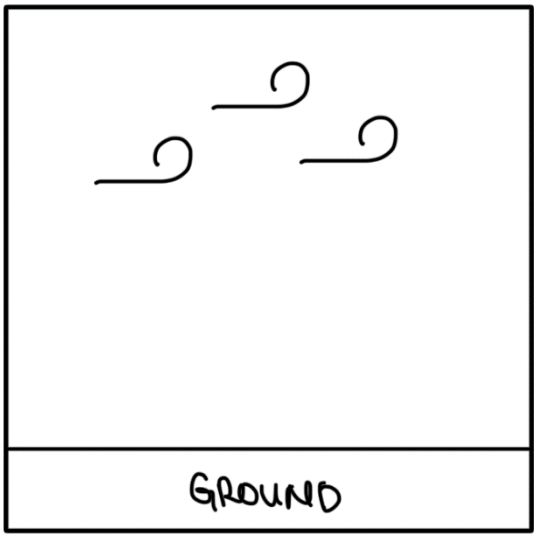

Figure 5.3: Wind Visual Effect Sketch

Figure 5.4: Actual Implementation of Leaves Falling Visual Effect

It is vital to note that the player can hear their own walking or running sounds. This is an audible cue to the player that something is about to happen, using the player's own sound effects. For example, a location marked with ② in Figure 5.1 indicates the presence of forest enemies. These enemies are sound-based, and they will attack anything near them that makes noise. As a result, players must exercise caution when using their own movement patterns such as walk, run, and crouch, as each produces a varied volume of sound.

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

Table 5.1: Movement’s Attract Enemy Distance

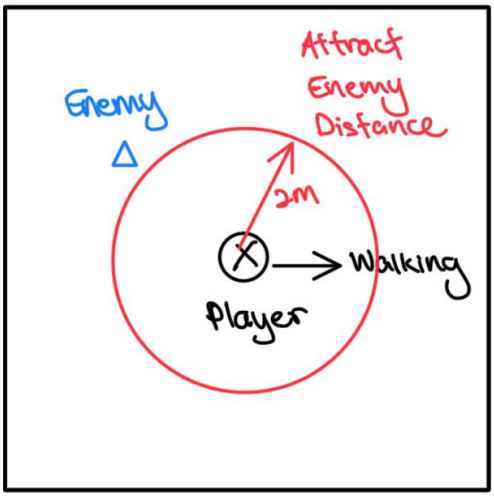

Figure 5.5: Attract Enemy Distance during Player Walk

Figure 5.5 demonstrates the attract enemy distance range of 2m when the player is walking. For the condition shown in Figure 5.5, the enemy will continue patrolling because the player is not within the distance range that would trigger the enemy to pursue him.

When the player is near the element ball (marked with ③ in Figure 5.1), the ambient sound progressively increases and becomes audible. The ambient sound is comprised of birds chirping and wind blowing background noise. However, when the player is not within range of the element ball, the ambient sound gradually fades and eventually disappears. By including this on purpose, developers hope that the player will be able to identify something and gather the element ball.

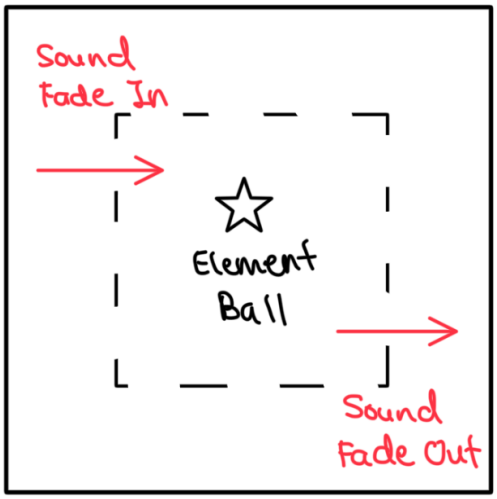

Figure 5.6: Ambient Sound Trigger Sketch

Following the collection of the element ball, the player will gradually regain hearing. They will be able to hear their footsteps, ambient sounds, and background music all at once. These indicate that the level has been completed, and the player can proceed to the following level, Lake Level.

5.1.2 Lake Level

This level will be about the Fiend, Taotie, hence the game theme will revolve around life and death. To make the player aware of the concept, the forest will change from a fresh forest to a dead forest (marked with ① in Figure 5.7). This environmental indicator attempted to portray the story of Taotie consuming everything on the planet. This implies that there is a threat on the map that could kill the player.

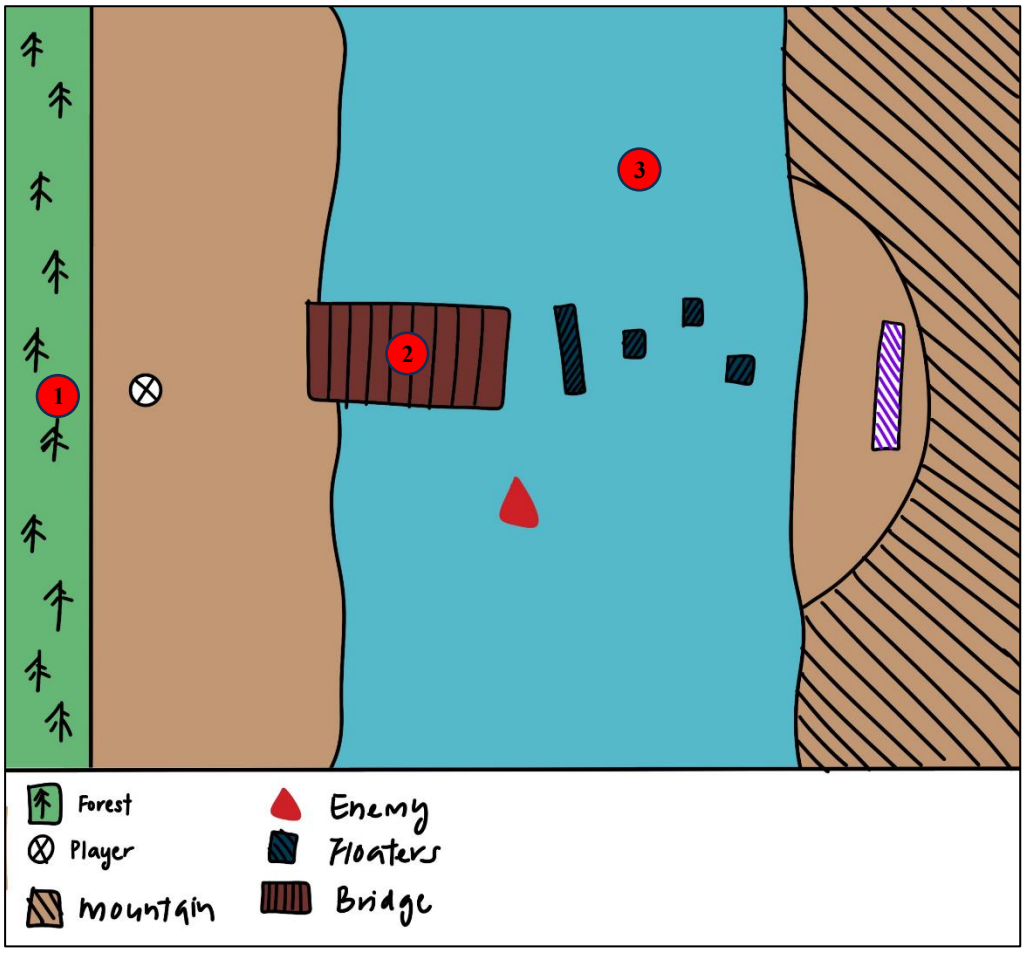

Figure 5.7: Lake Level Design Sketch

The spot marked with ② in Figure 5.7 will have a lake opponent that bites and destroys the bridge. This is another environmental cue that warns the player that an opponent will attempt to kill them. Furthermore, immediately before the enemy bites, there will be an enemy roaring sound to warn the player that something is approaching from the water. At this point, the player needs to flee faster to escape the opponent biting them along with the bridge.

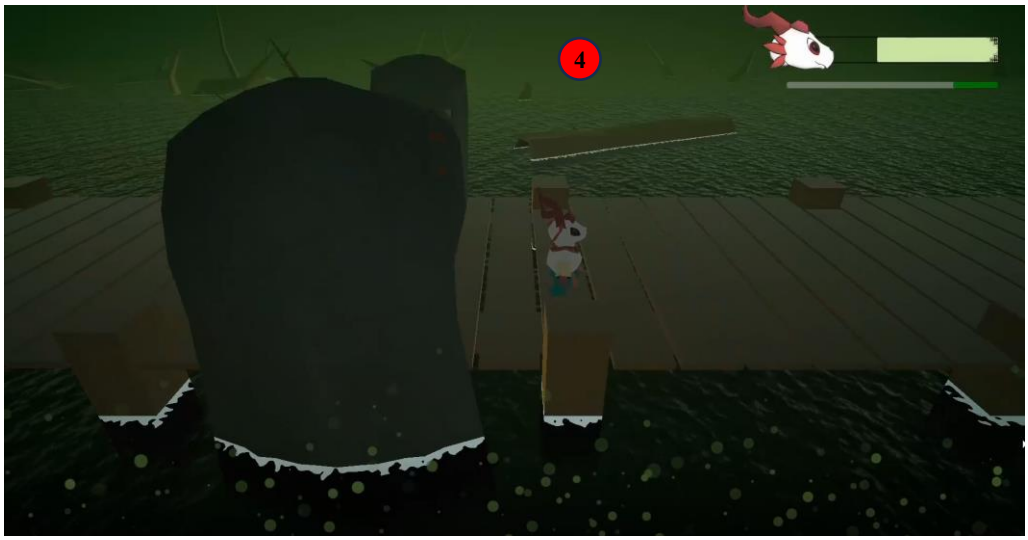

Figure 5.8: Actual Implementation of Bridge Enemy Attack

Green poison fog (marked with ④ in Figure 5.8) will cover the lake (marked with ③ in Figure 5.7) to the surrounding woodland. The poison is used to demonstrate that too many living objects have died, and it is a naturally occurring organic poison produced through the metabolic activity of living organisms.

In addition, a poison bar will show in the upper right corner of the player's heads-up display (HUD). When the value drops below a minimum value, another text indicator will emerge in the upper left corner of the screen countdown to remind the player to speed up their pace to pass the level. Figure 5.9 depicts the player's HUD at Lake Level. The stamina bar will stay for all levels, but the text indicator and poison bar were only used on this lake level.

Figure 5.9: Sketch of Player's HUD at Lake Level

Figure 5.10: Actual Implementation of Player's HUD at Lake Level

As indicated before, the text indicator in the upper left corner represents a countdown timer. Dropping the value to zero will result in the player losing the game and having to start over. This simulates the real-world environment, where inhaling too many hazardous chemicals over a lengthy period might result in death. To enhance the overall impact, there is an on-screen vignette effect that flickers in red when the poison value is reduced to a minimum and the text indicator appears on the screen.

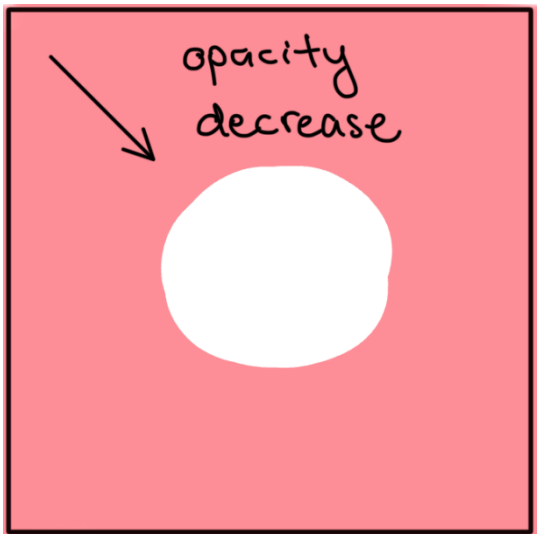

Figure 5.11: Sketch of On-Screen Flickering Red Vignette Effect

According to Unreal Engine 4.27 Documentation (n.d.), vignette is an effect that mimics the darkening of real-world camera lenses. The effect is especially noticeable around the image's edges. Figure 5.12 is a sample Unreal scene with the vignette effect enabled and disabled.

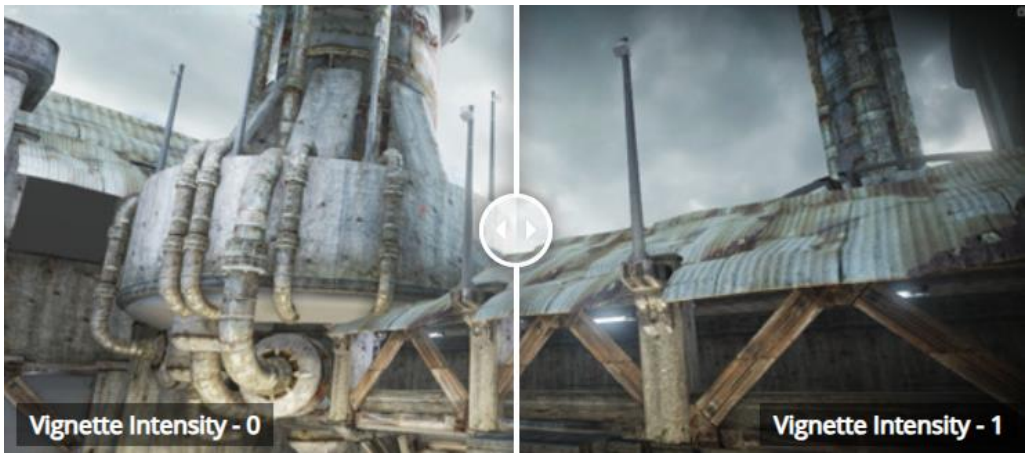

Figure 5.12: Unreal Scene without and with Vignette Effect

Figure 5.13: Actual Implementation of Before Vignette Effect Enabled

Figure 5.14: Actual Implementation of Vignette Effect and Text Indicator Enabled

Figure 5.14 shows a poison bubble VFX, which adds to the overall game atmosphere. This VFX adopts the same concept as the vignette effect, gradually turning red bubbles as the timing value approaches the minimum value. As a result, by utilizing all of these visual indicators, such as text cues and VFX, the player is expected to be able to recognize the game state and discover a means to complete the level.

5.1.3 Cave Level

In Section 2.5.1.1, tale said that Hundun is invisible to human. It was assumed that Hundun had taken away all of the world's light, stopping humans from seeing it. Therefore, Chroma Journey used this as inspiration to develop the cave level, which will revolve around the light mechanism. In general, to pass the level, the player must be aware of the light source and use the light ball (player's ability) with caution.

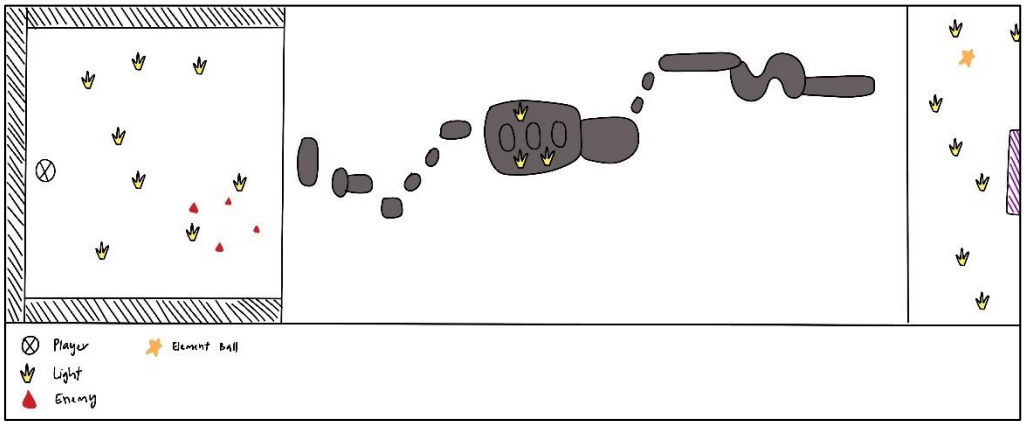

Figure 5.15: Cave Level Design Sketch

The lighting on the cave level is hazy and dim, making it difficult to see. With the misty environment, only the crystals illuminate the map, sending a message to the player that light is essential at this level. To emphasize the game concept, the crystals were left flickering with the blooming effect activated. Additionally, blooming is a halo effect that produces glow effects on bright objects such as lights or, in the case of Chroma Journey, crystals.

Figure 5.16: Chroma Journye's Cave Level Atmosphere

The crystal glowing in the scene lightens the surroundings and allows the player to see the level. As hundun hinders visibility, darker enemies (marked with ① in Figure 5.17) patrol near the crystals. Players must be cautious to avoid getting caught by these enemies. To make the enemies stand out, crowded enemies have been placed over the landscape and drawn to the nearest crystal when they spawn out.

Figure 5.17: Cave Gameplay Scene

The lighting near the element ball is excessively shine, as marked with ② in Figure 5.18. This alerts the player to do certain things to balance the lighting again as other objects, excluding crystals, will not be able to light up the world.

Figure 5.18: Lighting Before Element Ball Got Collected

After the player collected the element ball, the lighting will be balanced back and only the crystal continue shining. These indicate that the level has completed, and player will be able to access to next level – Boss Level.

Figure 5.19: Lighting After Element Ball Got Collected

5.1.4 Boss Level

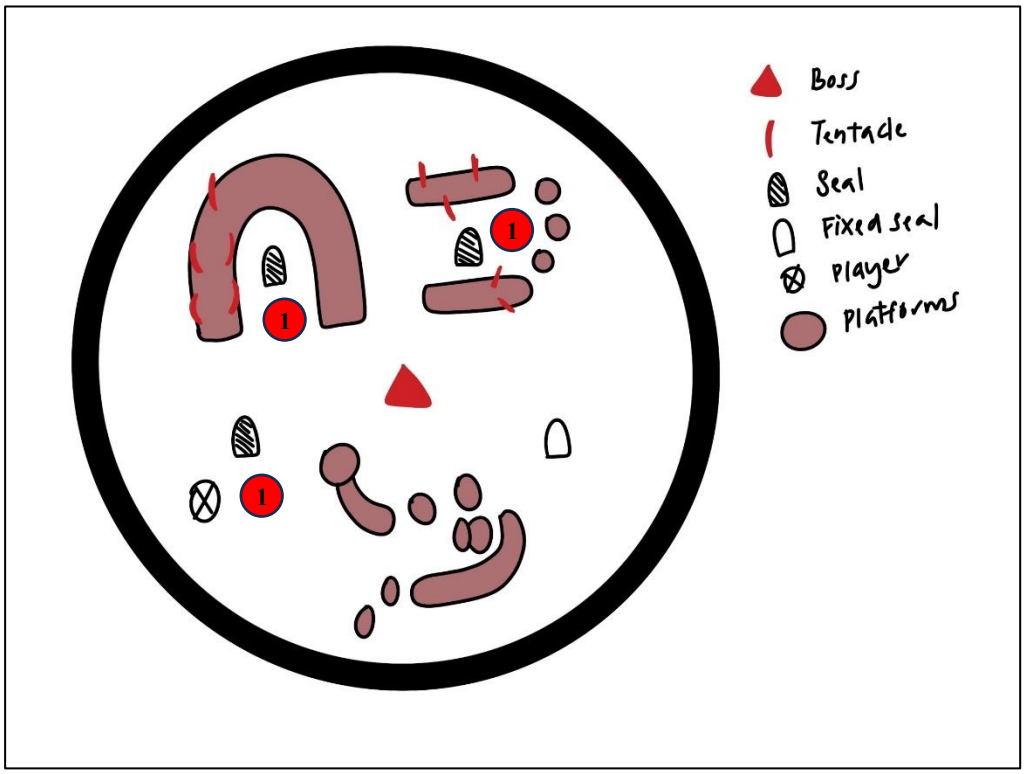

Figure 5.20: Boss Level Design Sketch

This level will revolve around the Fiend Taowu. The game's theme will be related to color since Taowu's presence in mythology frequently causes chaos and problems, much like the gloom that could arise from a world devoid of color. To make the player aware that color is essential in this level, the cave will change from color to grayscale. This environmental transition aimed to tell the story of Taotie emptied the planet of its vivid hues.

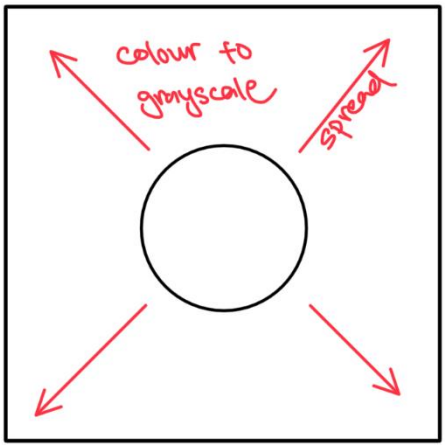

Figure 5.21: Color Transition to Grayscale

Figure 5.20 indicates that three element balls must be returned to the seal stone (marked with ①). During the game, the boss and the player compete to see who can regain their power the fastest. Thus, to demonstrate progress in the game, the color will gradually return from 33% to 66% and eventually 100% color if the player successfully seals the element ball onto the seal stone. This color shifting will alert the player that something has to be done to restore the color.

Figure 5.22: Fully Grayscale Scene

Figure 5.23: Scene with 33% Color Restored

Figure 5.24: Scene with 66% Color Restored

Figure 5.25: Fully Color Scene

Since this level is a time-based challenge in which the player and the boss fight to see who can regain their power the fastest, a circle progress meter appears on top of both the seal stone and the boss. This visual clue informs the player that a specific action is required to refill the circle progress bar. To make this refilling action clear, a text message will appear on the screen when the player approaches the seal stone.

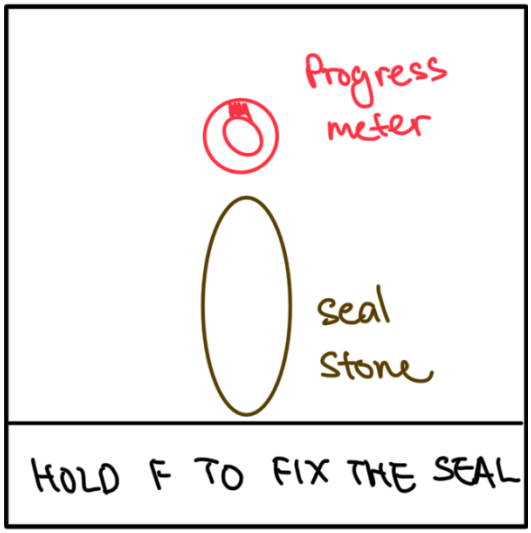

Figure 5.26: Sketch of Visual Cue When Player Approaches Seal Stone

Figure 5.27: Actual Implementation of Visual Cue When Player Approaches Seal Stone

When the seal stone's restoration value exceeds 50%, the boss will begin attacking, stealing the power that the player restored to the seal stone. To inform the player that there is a stealing force from the monster, a prompt text will appear, which leads the player to stun the boss by throwing a light ball into its mouth.

Figure 5.28: Actual Implementation of Visual Cue When Boss Got Triggered

In addition, the boss's seeking direction will be changed to the seal stone from which the boss is now stealing power, and an attacking animation will be played by the boss, as indicated by ② in Figure 5.28. By combining these few visual signals, the player should be able to figure out that a boss has been triggered and is now attacking.

Another clear visual clue is that when the text message shown in Figure 5.28 appears, the path leading to the boss's mouth begins to rise from the ground (as marked with ③ in Figure 5.28). During this period, the camera will be in shaking mode, simulating the real-life impacts of cave stones dropping. When the platform moves up, a sound effect will play. By combining the visual and aural cues, the player will have a better chance of seeing that the platform is rising and, ideally, linking this signal with other boss-triggered signals and acting properly to seal the stone faster than the boss.

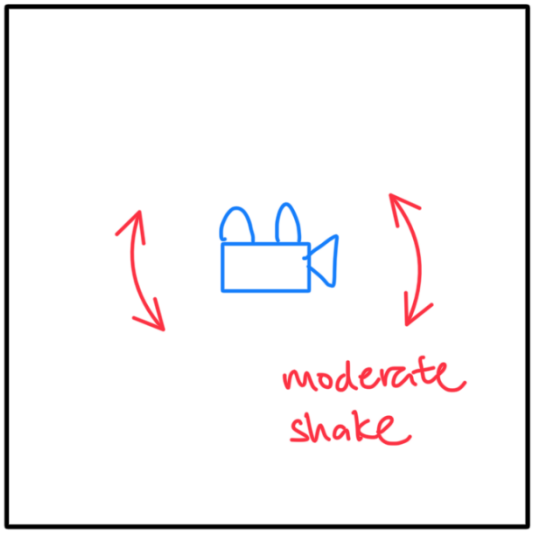

Figure 5.29: Camera Shaking Mode during Rising Platform

Furthermore, when the boss is stun, there will be a stun animation, sound effect, and visual effects displayed simultaneously. With this, the player will be certain that the boss has been stunned and can continue rushing to restore the seal stone.

Figure 5.30: Boss Stun Visual Clues

Once the level is completed, the level will be filled with color as shown in Figure 5.25, and the ending cutscene will be played to indicate the game is completed. The cinematic will depict the absence of opponents in the game as well as the world's recovery, which includes lively forest and bluish lake.

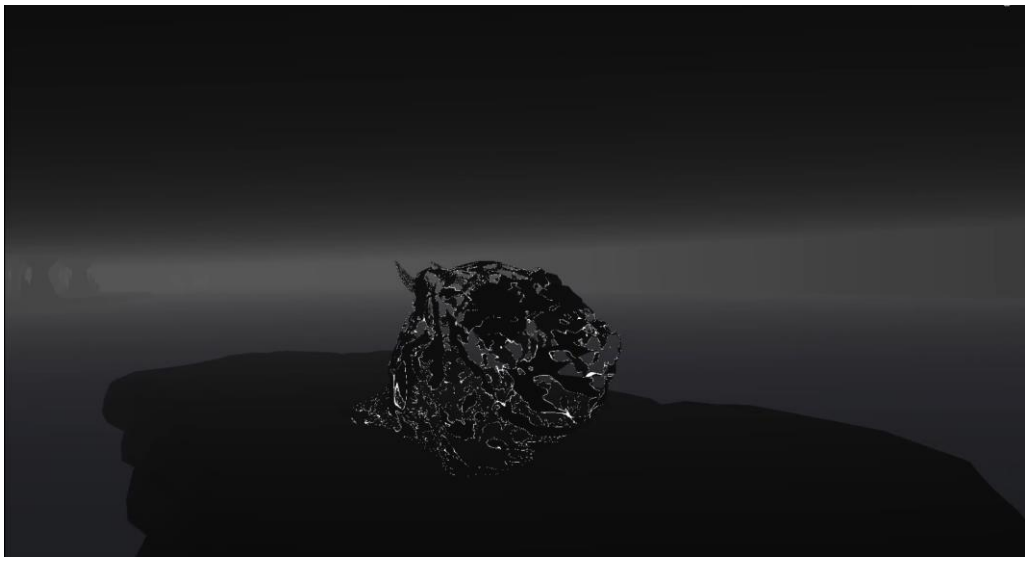

Figure 5.31: Actual Implementation of Cutscene – Disappearance of Opponents

Figure 5.32: Actual Implementation of Cutscene – Lively Forest

5.2 Summary

Chapter 5 describes the environmental fluctuations found in Chroma Journey and how they are displayed as visual and aural cues. In addition, Chroma Journey used a variety of cues, including text, sound effect, VFX, cutscenes, and animation, to create the game atmosphere. Effective arrangement of these cues will improve the overall gameplay experience.

Chapter 6: Data Analysis and Discussion

This chapter discusses the data analysis for the survey conducted for the topic "Environmental Fluctuation: Player Awareness and Adaptability in Platform Adventure Game" as well as the results of the data collection.

The questionnaire will be divided into two key sections: demographic and playtesting post-survey. Upon registration, participants are first required to take a one-time pre-survey. Participants who enjoy flat-color games will continue with the study after registering and being screened to remove those who find flat-color uncomfortable.

Following the play session, participants will be asked to complete a second survey in which they will be asked to rate how much they feel that environmental cues affect their awareness and whether this can lead to an improvement in their response.

6.1 Demographic

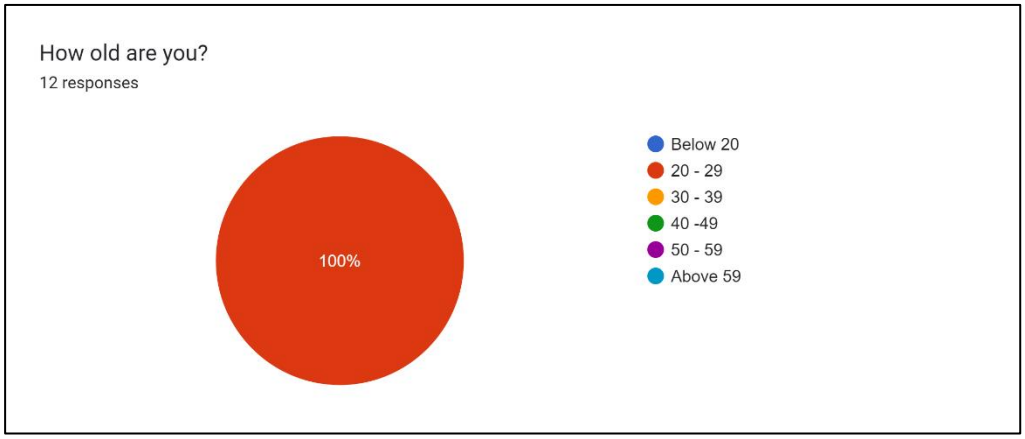

Figure 6.1: Chart – Participants' Age Range

Figure 6.1 illustrates that all of the participants are between the ages of 20 and 29, which meets one of the research requirements that focuses on young adults aged 20 to 29.

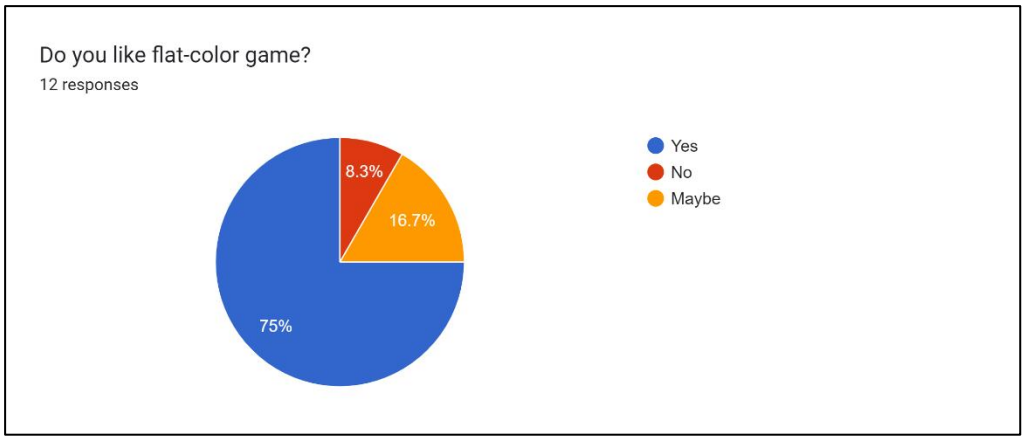

Figure 6.2: Chart – Participants' Favor on Flat-Color Game

Figure 6.2 illustrates that 91.7% of participants are either enjoy or maybe enjoy playing flat-color game. Therefore, the 8.3% who dislike playing flat-color game will be disqualified for the playtesting session.

As a result, 11 out of 12 participants will have satisfied both requirements, making them eligible to participate in the game and the second survey.

6.2 Playtesting Post-Survey

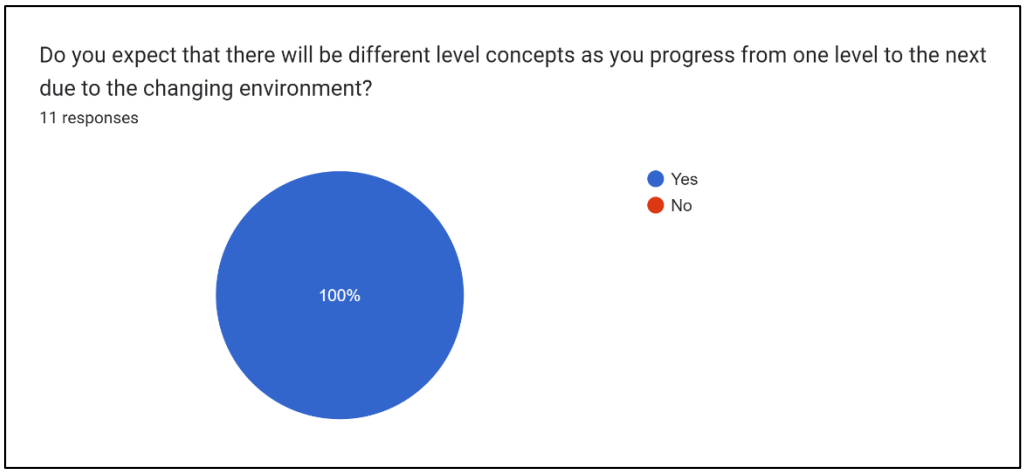

Figure 6.3: Chart – Game Level Overview Expectation

All qualified playtesters are expected to observe a different level concept when the environment changed during the level transition. The majority of them justified that when there is a change in the scenery or decorations, players will interpret it as a cue to adjust the gameplay style.

6.2.1 Forest Level

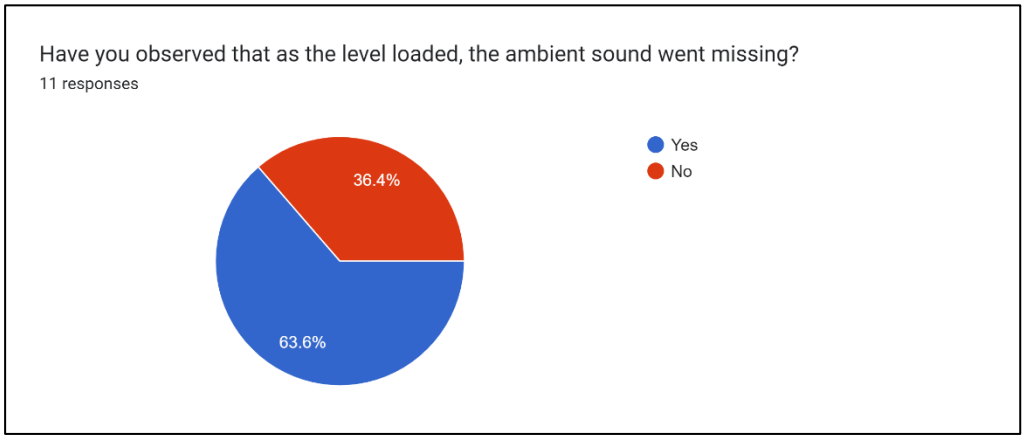

Figure 6.4: Percentage of Participants Noticing Missing Ambient Sound

Figure 6.4 shows that 63.6% of participants noticed the ambient sound gone missing, while another 36.4% did not.

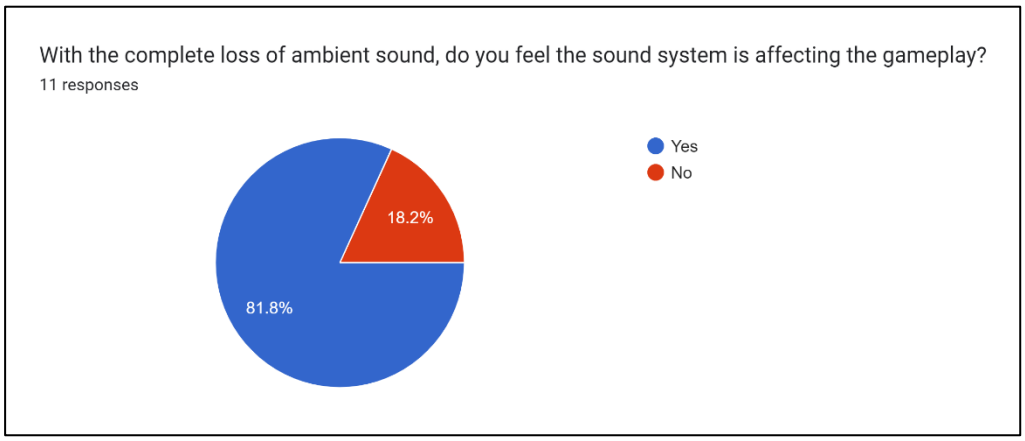

Figure 6.5: Percentage of Participants Perceiving Gameplay Impact Due to Complete Ambient Sound Loss

Figure 6.5 shows that 81.8% of participants believe the sound system has an impact on gaming when the ambient sound is steadily reduced until it is completely gone, while 36.4% disagree.

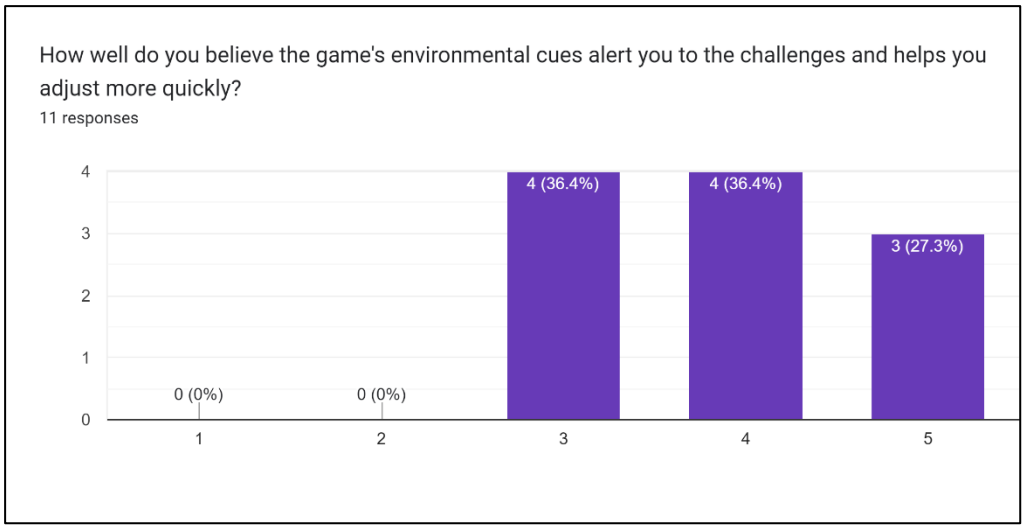

Figure 6.6: Participant Perception of Game's Environmental Cue Effectiveness in Alerting and Adjusting

Figure 6.6 displays the participants' ratings of the forest level, which vary from 3 (normal) to 5 (excellent), depending on how well environmental clues helped them recognize the problems and successfully adjust their gameplay style.

Even with a majority rating of 3 or 4, there is still potential for improvement because some participants failed to notice that the ambient sound had gone missing, which is related to the level challenge. As a result, some advice adding cutscenes showing quiet surroundings and a living entity, possibly an animal, making noises and running past. Following that, the monster chases the animal and kills it. By including this type of cinematic, the player will understand that the monster is sound-based and will kill anyone who makes noises near them.

Furthermore, the ambient sound on the prior tutorial level should be louder, as some participants may have missed the lack of ambient sound in the woodland level due to the previous level's weak ambient sound.

6.2.2 Lake Level

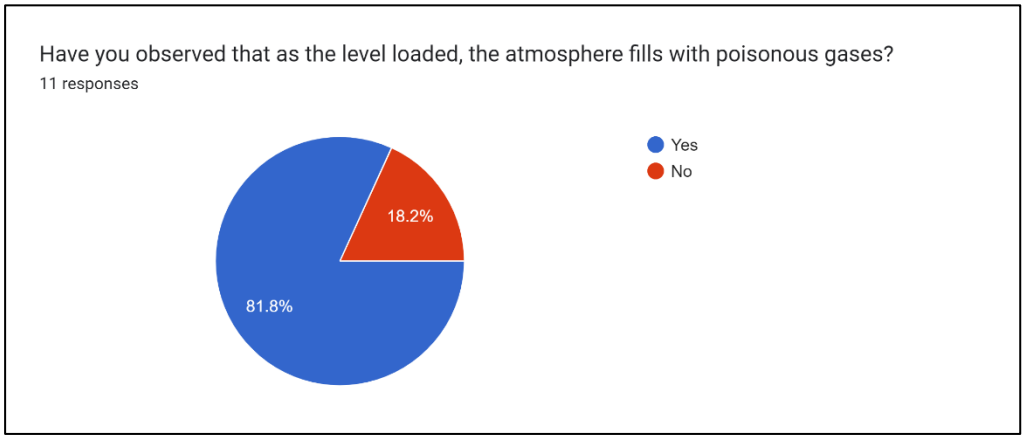

Figure 6.7: Percentage of Participants Noticing Poisonous Gases

Figure 6.7 demonstrates that 81.8% of participants observed the presence of toxic gases in the atmosphere, whereas the remaining 18.2% did not.

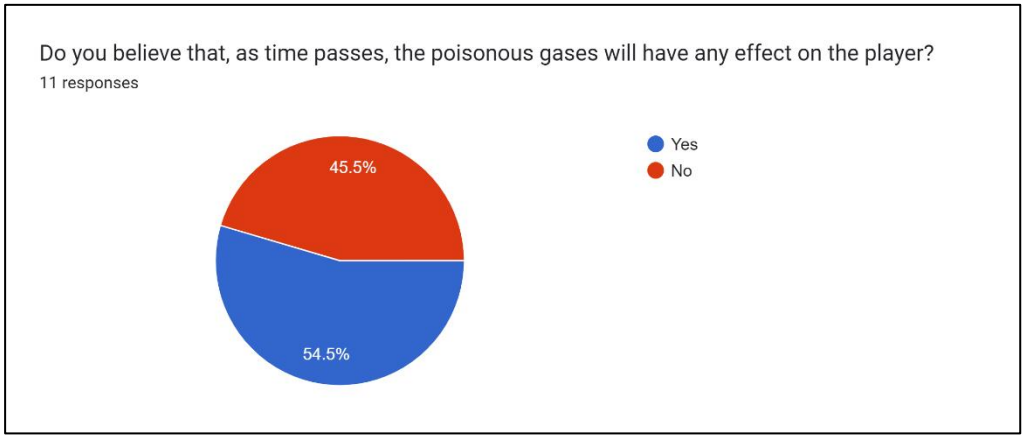

Figure 6.8: Percentage of Participants Perceiving Gameplay Impact Due to Dense Poisonous Gases

Figure 6.8 shows that 54.5% of participants believe poisonous gases affect games over time, whereas 45.5% disagree.

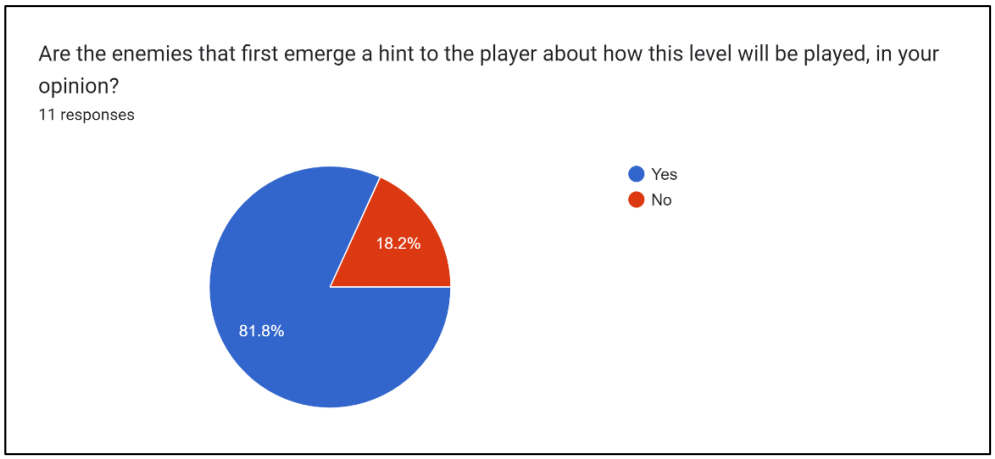

Figure 6.9: Percentage of Participants Noticing Initial Enemy Presence as Gameplay Indicator

Figure 6.9 shows that 81.8% of participants believe the initial enemy presence as a gameplay indicator, indicating how this lake level will be played, while 18.2% disagree.

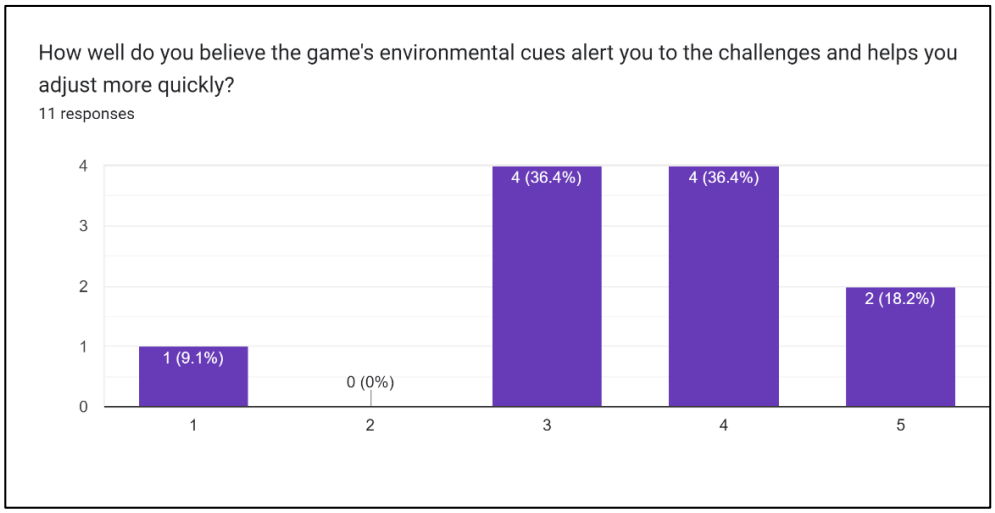

Figure 6.10: Participant Perception of Game's Environmental Cue Effectiveness in Alerting and Adjusting

Figure 6.10 displays the participants' ratings of the lake level, which range from 1 (poor) to 5 (excellent). Even with an average rating of 3 or 4, many level areas are still not clearly defined. Almost half of the respondents do not believe that the poisonous gases endanger the player's life. As a result, recommendations to place skulls or dead bodies near the lakeside forest will be able to address the above issue of no one understanding where the poison gases came from.

6.2.3 Cave Level

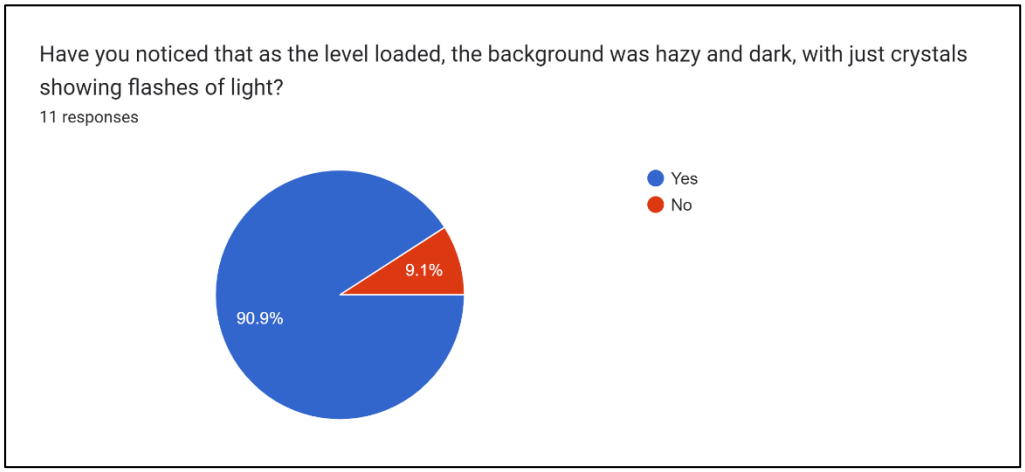

Figure 6.11: Percentage of Participants Noticing Hazy Background with Crystal Light

Figure 6.11 demonstrates that 90.9% of participants observed the presence of crystals flashed in hazy dark background, whereas the remaining 9.1% did not.

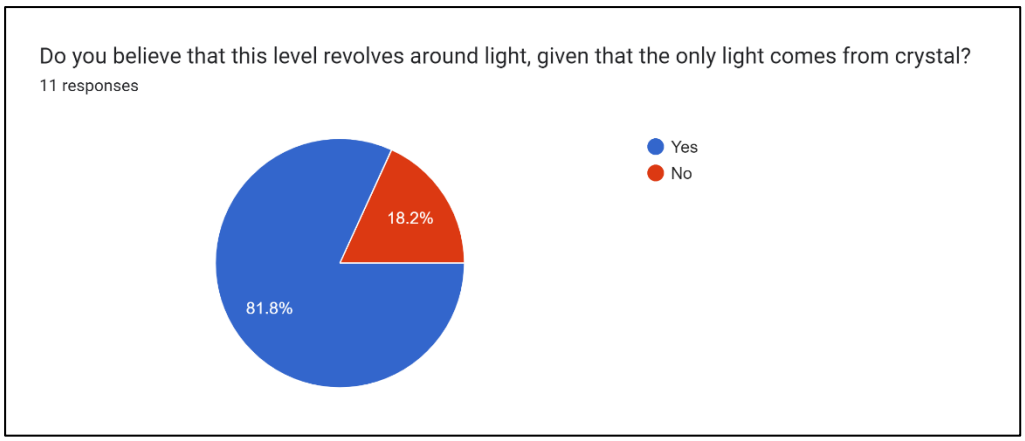

Figure 6.12: Percentage of Participants Perceiving Light-Centric Gameplay with Crystal Illumination

Figure 6.12 reveals that 81.8% of participants feel this level is centered on light, assuming that the only light source is crystal, while 18.2% disagree.

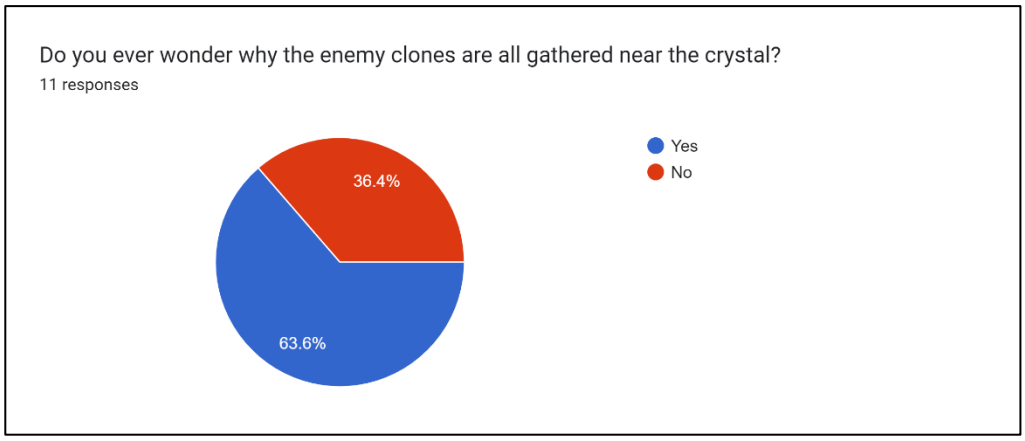

Figure 6.13: Percentage of Participants Noticing Enemy Clones Near the Crystal

Figure 6.13 shows that 63.6% of participants have idea as to why all of the clones are clustered near the crystal, while 36.4% disagree.

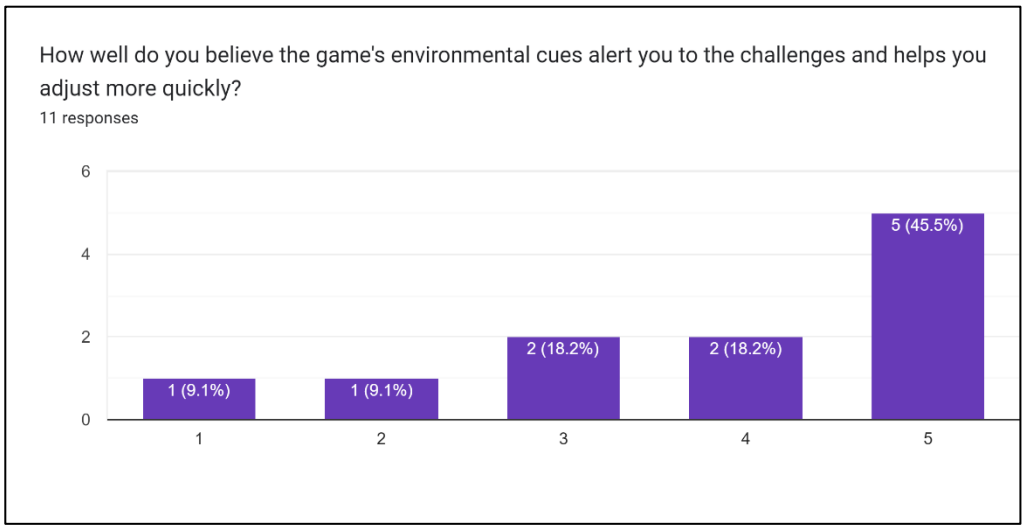

Figure 6.14: Participant Perception of Game's Environmental Cue Effectiveness in Alerting and Adjusting

Figure 6.14 displays the participants' ratings of the cave level, which range from 1 (poor) to 5 (excellent). The majority rate this cave level a 5, but some say the enemy character blends in with the ground texture, making it impossible to spot. As a result, it would be beneficial to have a cutscene demonstrating the enemy rushing to the light source at once. This would better explain the enemy's light-based nature and its attraction to any light source.

6.2.4 Boss Level

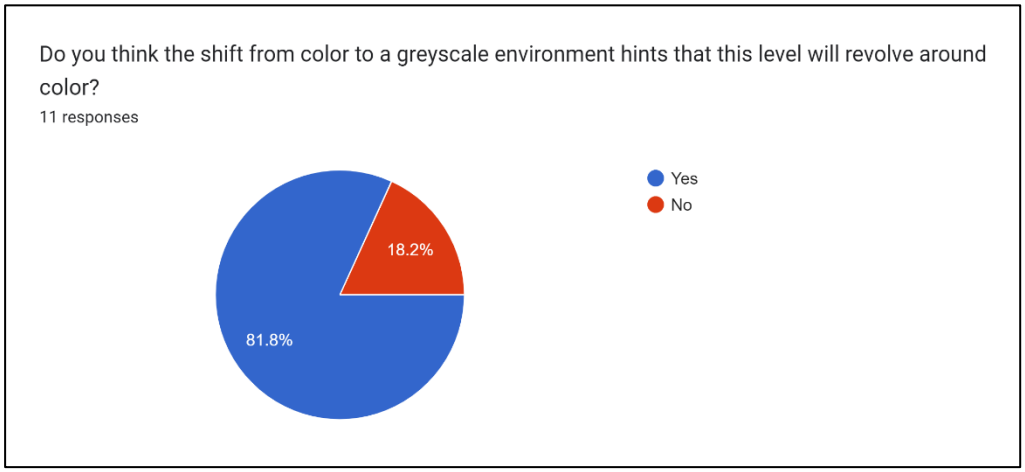

Figure 6.15: Percentage of Participants Noticing Transition from Color to Grayscale Environment

Figure 6.15 demonstrates that 81.8% of participants observed the environment changing from color to grayscale when they were entering this level, whereas the remaining 18.2% did not.

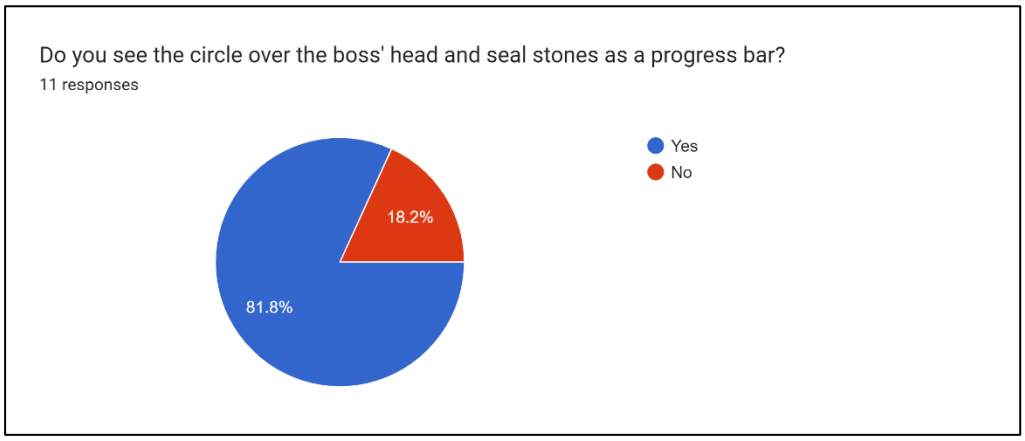

Figure 6.16: Percentage of Participants Interpretating Circle Over Boss' Head and Seal Stones as Progress Bar

Figure 6.16 shows that 81.8% of participants successfully interpret the circle over the boss' head and seal stones as a progress bar, while 18.2% disagree.

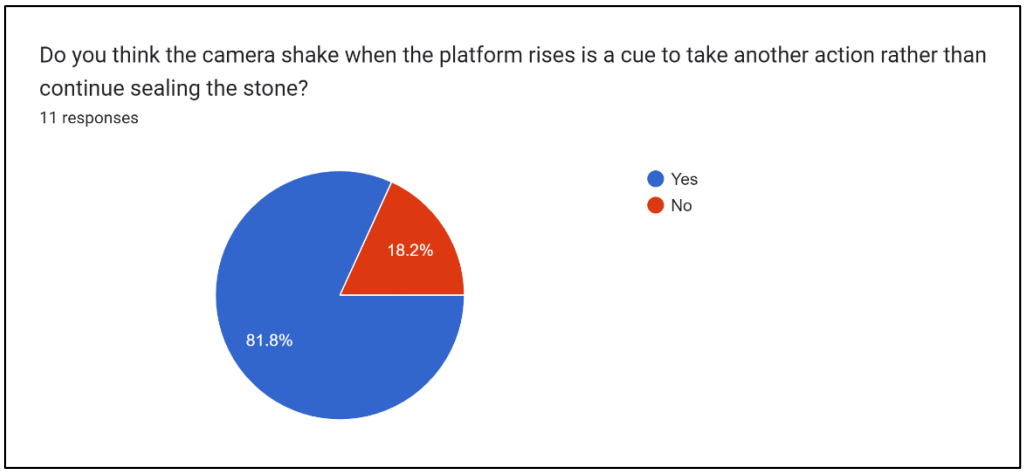

Figure 6.17: Percentage of Participants Perceiving Camera Shake as Cue to Take Another Action

Figure 6.17 shows that 81.8% of participants agreed that camera shaking during platform rise is a cue to perform another action rather than continuing to seal the stone, while 18.2% disagreed.

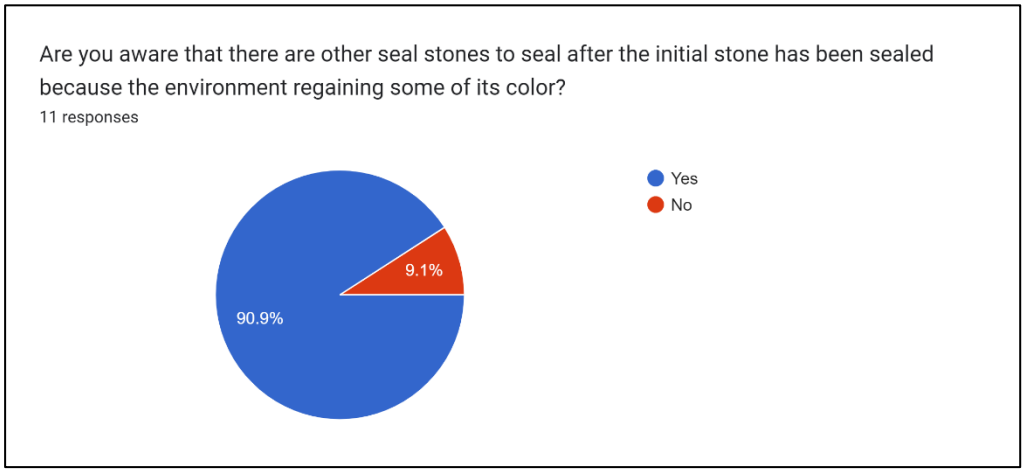

Figure 6.18: Percentage of Participants Perceiving Additional Seal Stone Exist After Initial Sealing Due to Environment Regaining Color

Figure 6.18 shows that 90.9% of participants are aware of other seal stones that need to be restored due to the environment regaining color after first sealing, whereas 9.1% are unaware.

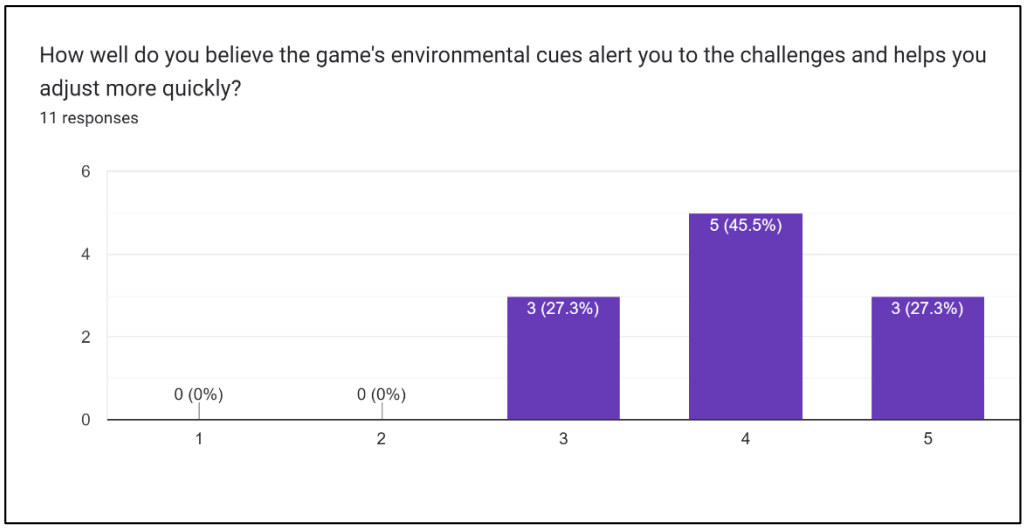

Figure 6.19: Participant Perception of Game's Environmental Cue Effectiveness in Alerting and Adjusting

Figure 6.19 shows the participants' ratings of the boss level, which range from 3 (normal) to 5 (excellent). This cave level is rated a 4 by the majority, however some disagree. For example, some argue that the UI should face the camera, with the boss progress bar shown on the camera rather than on top of the head. Showing this progress bar on camera will make the player more aware of the boss's progress, as the present progress bar is difficult to see.

6.3 Summary

Chapter 6 focuses on analyzing the playtesting data. However, due to time constraints, only 12 responses were recorded. Overall, responses pointed to a lack of UI guides at all levels of the Chroma Journey. Some of the answers justified and made recommendations for how the game may be improved, which were all discussed in the aforementioned session. In general, the game should have at least one cutscene for each level because each level has unique characteristics, and conveying the notion through cutscenes is a better option in Chroma Journey than using text messages.

Chapter 7: Conclusion

This chapter will wrap up the development issues and discuss potential enhancements to the game project, Chroma Journey: The Last Guardian. Furthermore, this thesis can be used as a future reference to evaluate the usefulness of visual and aural signals in conveying environmental fluctuations.

7.1 Limitation

The author faced numerous challenges throughout the development process, the most significant of which was the heavy schedule. With four courses on hand, time restrictions would be the most significant challenges encountered during gaming project development. The workload is becoming heavier as the team struggles to communicate effectively during the first semester of development. The majority of the game's content was not fixed, and a lot of details were added during production. Furthermore, the team once experienced a complete change in game concept during the second stage of game production. However, all of these issues were resolved following a thorough discussion within the team and with supervisors.

7.2 Future Work

As indicated in Chapter 6, the game lacks an in-game guide, which can be in the form of a visual cue such as a text message or a visual effect, or an aural signal such as a sound effect or background music. Chroma Journey lacked a fluid game flow because the player had no idea what would happen next. By improving this weakness, Chroma Journey will be able to have a smoother game flow, improving the overall gameplay experience.

In addition, the player's climbing animation was seen as a severe issue. Chroma Journey relies heavily on the climbing mechanics; if this issue persists, it could break the game experience as players will feel demotivated as they keep losing the game and being trapped at the same level.

Chapter 8: Reference

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Appendix A: Project Paper Consultation Logbook

Project Paper Consultation Logbook	
Project Title	Chroma Journey: The Last Guardian
Student Name	Leong Xue Qian
Student ID	2001345
Year/Semester	Y3S3
Supervisor	Ms. Chow Mee Mooi

WEEK 01	
02/11/2023 (Thursday) Briefing session Before the meeting, I was given the FYP handbook, which had all of the pertinent information. The handbook has only a few ambiguities. By attending the briefing, I learned the following: (1) AI tools are permitted to be used during the development process, but only as a brainstorming tool; groups should not take whatever the AI produced content as their own assets; *and* (2) research topics must be related to the game pitch; at least one research topic should be proposed as long as the one idea is practical for both game pitches. Group forming I have formed a group with Wan Yi (GV), Keen Mun (GS), and Zi Ming (GS). We were called the ***PolyMasters***.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 [5] Poor Satisfactory Good	**Date:** 22/12/2023

WEEK 02	
08/11/2023 (Wednesday) Consultation Earlier in the second week, my group had a discussion about potential game concepts and had settled on two: an adventure game and a horror game, both of which would be 3D games. Following a quick discussion of the pitch with Dr. Simon and Puan Nik, Dr. Simon makes a serious recommendation that we continue on the horror theme game set in a graveyard, as it introduces Chinese culture and has a unique selling point. Another adventure game pitch about the supernatural is too common, with 9 out of 10 games being of this type. Comments – Learn more about Chinese death traditions and possibly some funeral rituals. – Working on high poly assets if opting for the horror theme game, as low poly will always hinder gaming immersion. – Aside from the concept and mood board, the user interface wireframe should be well-drawn and not just sketches. – The game title may include an emphasis on the Chinese term, followed by the English game title at the bottom, as is typical for horror films. We had a great discussion after that meeting, and we have integrated feedback to enhance and refine the current idea.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 [5] Poor Satisfactory Good	**Date:** 22/12/2023

WEEK 03	
15/11/2023 (Wednesday) Proposal Presentation My group has made two proposals to our supervisors, which are as follows: a. Chroma Journey – A 3D adventure game set in a monochromatic environment where players must collect color seeds to restore world order. The primary mechanic will revolve around the color and animal. b. Graveyard Manager – A 3D horror game in which the player plays the graveyard cleaner role. The player will discover strange happenings while cleaning and must perform religious ceremonies to help the soul find peace. Comments – The game file should not be more than 20GB. – Chroma Journey 1. Incorporate the 12 Chinese zodiac signs. 2. Set up puzzle that the player must solve by collecting the true pieces of selected zodiac animals. 3. Instead of allowing the color to bloom out as the player finished the game, it would be preferable if it could bloom from one region to the next when the player solved the area puzzle. – Graveyard Manager 1. Add a few more ghosts, which could result in varied endings depending on the different exorcisms. 2. Research, revise, and remake the ghost character in 3D.	**Supervisor signature:** 

16/11/2023 (Thursday) Consultation after Industrial Sharing Talk A brief consultation with Ms. Christie and Dr. Lim has taken place. They both recommend that we develop the Chroma Journey game since the Graveyard Manager is a difficult project for my group because we lack game development experience. The primary thing about the game is the spooky sensation and surroundings, which is difficult for us to generate, and again, we do not have the power to create the music for this type of horror game, therefore an adventure game would be preferable. They both bring out several limitations for Chroma Journey, such as the light planting and animal-related puzzle. Ms. Christie suggests that we make effective use of the Chinese zodiac and their characteristics when creating the animal-related puzzle. While Dr. Lim advises against using the light planting technique due to technical challenges and possibly some experience issues. ***17/11/2023 (Friday)*** Thesis Briefing Ms. Christie briefed us on: a. What we should include in each chapter. b. How many chapters we should include. c. How to choose a research topic. Ms. Christie also sent out some tips following the briefing for us to see if the chosen research topic was feasible.	
Progress (please circle the feedback) 1 2 3 4 (5) Poor Satisfactory Good	**Date:** 22/12/2023

WEEK 04	
21/11/2023 (Tuesday) Thesis Consultation I suggested a research topic that looked into minimalist design and color impact, but my supervisor pushed me to modify and try to make an area of focus, as it is now too broad and difficult to execute through game. ***22/11/2023 (Wednesday)*** Project Consultation My group created a GDD to show our concept as well as some mechanics, but our supervisors suggested that we provide some visual aids the next time because it is difficult to convey the idea through words. As a result, we must submit the design concept as well as the game flow before the next meeting.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 [5] Poor Satisfactory Good	**Date:** 22/12/2024

WEEK 05	
29/11/2023 (Wednesday) Project Consultation Given that the existing blockout level is difficult to visualize, the supervisor requested that we update the level design to at least include dummy assets. At the very least, by next week, to present a portion of the level with built-in mechanics. ***01/12/2023 (Friday)*** Thesis Consultation There should be some description of the subtopic before putting the table. Figures are recommended for elements that require greater explanation.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 [5] Poor Satisfactory Good	**Date:** 22/12/2023

WEEK 06	
06/12//2023 (Wednesday) Project Consultation We are asked to work quickly in order to complete at least a tutorial ground. ***08/12/2023 (Friday)*** Thesis Consultation Improvements to the research question and objective have been suggested. This has provided some insight into how to connect the section on the literature review.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 [4] 5 Poor Satisfactory Good	**Date:** 22/12/2024

WEEK 07	
12/12//2023 (Tuesday) Thesis Consultation The study questions have undergone more refinement, and additional subtopics, such as the types of visual and auditory signals, should be included in the literature review. After that, determine which cues are appropriate for use in the game and do a study based on them. ***13/12/2023 (Wednesday)*** Project Consultation We are suggested to adjust the game's darkness so that it may be seen clearly with a projector, as our game's ambient lighting is not very strong. To make our game more immersive and comprehensive, we are also recommended to up the puzzle and sound effects.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 [5] Poor Satisfactory Good	**Date:** 22/12/2023

WEEK 08	
18/12//2023 (Monday) Game Alpha Presentation The guest has identified certain problems with the game and offered suggestions. – Since the game is mostly centered on environmental puzzles, level design should be improved as the existing game mechanics are too minimal and could limit the replayability of the experience. – Further refinement of the main character is necessary, as the existing model's polygon and colour scheme are portraying the character negatively. – The presentation slide should be more specific and provide more information on what to do next, rather than being vague. – The navmesh must also be modified so that the hundun AI's movement track appears more realistic.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:** 22/12/2023

WEEK 09	
01/02//2024 (Thursday) Project Consultation During the semester break, our group holds an internal discussion on changing the game concept. However, according to what we presented, we were told to stick with the prior approach while attempting to incorporate some of the new ideas.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 [4] 5 Poor Satisfactory Good	**Date:** 8/5/2024

WEEK 10	
08/02//2024 (Thursday) Project Consultation We are advised to scale down our entire game to make it more manageable at the present, as well as to separate the levels so that each member can handle one level.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 [3] 4 5 Poor Satisfactory Good	**Date:** 8/5/2024

WEEK 11	
15/02//2024 (Thursday) Project Consultation Since we are making significant changes to our game concept and design, we are essentially fixing the concept to ease future development. However, we are urged to update visually rather than vocally.	**Supervisor signature:** 
Progress (please circle the feedback) 1 2 [3] 4 5 Poor Satisfactory Good	**Date:** 8/5/2024

WEEK 12	
21/02//2024 (Wednesday) Thesis Consultation The research sampling should extend to include the age group. ***22/02//2024 (Thursday)*** Project Consultation The game title needs to be improved to make it appealing and consistent with the game theme. It would be better to add animated scene throughout the level transition to ensure a seamless flow. When designing the levels, we are urged to consider the lighting so that they are playable, as well as the props, which should be functional rather than merely decorative.	**Supervisor signature:** 
Progress (please circle the feedback) 1 2 3 [4] 5 Poor Satisfactory Good	**Date:** 8/5/2024

WEEK 13	
29/02//2024 (Thursday) Project Consultation Strongly advised to focus on level completion to show how the game flows.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 [3] 4 5 Poor Satisfactory Good	**Date:** 8/5/2024

WEEK 14	
There are no project or thesis consultations.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 [3] 4 5 Poor Satisfactory Good	**Date:** 8/5/2024

WEEK 15	
14/03//2024 (Thursday) Project Consultation Lighting and fog in the cave level should be more vivid. In addition, a defense mechanic should be added to the player in the lake level, to make it challenging and entertaining.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 [3] 4 5 Poor Satisfactory Good	**Date:** 8/5/2024

WEEK 16	
21/03//2024 (Thursday) Project Consultation The character should be brightened so that it does not blend in with the scenery, and perhaps an outline or glowing effect should be applied to the player to make it more visible.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 [3] 4 5 Poor Satisfactory Good	**Date:** 8/5/2024

WEEK 17	
There are no project or thesis consultations.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 [3] 4 5 Poor Satisfactory Good	**Date:** 8/5/2024

WEEK 18	
04/04//2024 (Thursday) Project Consultation For the load scene to flow more smoothly, the opening cutscene should have a fade in and out effect.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 [3] 4 5 Poor Satisfactory Good	**Date:** 8/5/2024

WEEK 19	
There is no project consultation.	**Supervisor signature:** 
Progress (please circle the feedback) 1 2 [3] 4 5 Poor Satisfactory Good	**Date:** 8/5/2024

WEEK 20	
18/04//2024 (Thursday) <u>Project Consultation</u> The game flow is well-planned, but we are asked to combine all the elements into one and add more details to the environment. Furthermore, we are advised to make the world restoration more visible to bring out our game idea, which focuses on the four Fiend qualities.	**Supervisor signature:** 
Progress (please circle the feedback) 1 2 3 [4] 5 Poor Satisfactory Good	**Date:** 8/5/2024

WEEK 21	
25/04//2024 (Thursday) Project Consultation The sound effect for cave walking has to be improved because it is not appropriate for the game. Aside from that, there are a few small things to follow up on and clean up.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 [3] 4 5 Poor Satisfactory Good	**Date:** 8/5/2024

WEEK 22	
02/05//2024 (Thursday) Project Consultation Since our game is about restoring game balance, it would be better to include environmental changes in the ending cutscene. Besides, the sound effects must be improved to fully immerse the player.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 [4] 5 Poor Satisfactory Good	**Date:** 8/5/2024

WEEK 23	
06/05//2024 (Monday) Game Beta Presentation The guest has identified certain problems with the game and offered suggestions. – Additional visual and aural cues would improve the gaming experience. – To enhance the gaming experience, consider putting a dead zone near the map's border instead of creating an invisible wall. This allows players to fall and die naturally.	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 [4] 5 Poor Satisfactory Good	**Date:** 8/5/2024

Appendix B: First Game Idea Proposal Presentation Slides (Chroma Journey)

TEAM MEMBERS

HO KEEN MUN	2100171	GS
WONG ZI MING	2003878	GS
LEONG WAN YI	2101503	GV
LEONG XUE QIAN	2001345	GV


CHROMA JOURNEY
GAME TITLE


GAME GENRE
3D TOP DOWN, HORROR, ADVENTURE
ART STYLE
3D LOW-POLY, FLAT COLOR, MONOCHROMATIC
CHROMA JOURNEY | POLYMASTERS


GAME INTRODUCTION
A little spirit called **Chroma** who is the only spirit in the **black forest** takes on his journey to find the **seed of color** to recover the **colorful world**.
Along the adventure, Chroma is required to communicate or seek help with the **animals** to solve the **puzzle** that is blocking his way to the **destination**.
CHROMA JOURNEY | POLYMASTERS

GAME MECHANIC

COLOR GUIDANCE

Color is the main direction clue for players in the game.

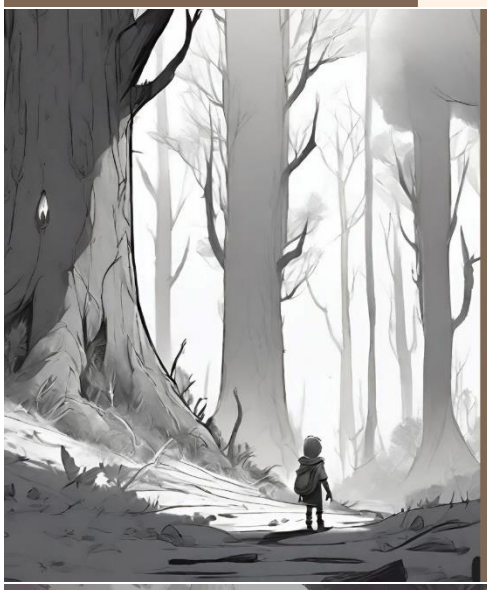
UNKNOWN CREATURES

Avoid being caught by the **monster** in the forest.

STAY IN THE LIGHT

Stay in the **light** to **maintain and recover stamina** to reduce the appearance of the monster.

CHROMA JOURNEY | POLYMASTERS



GAME STORY

One day, the ancient colour tree began to wither, and the entire **forest began to lose its colour**.

Chroma was sent on a journey by the ancestors to **search for colour seeds** in order to save the woodland, which was losing its colour. Throughout the adventure, Chromia slowly **discovers the secret or truth** behind the fading, leading him to...

CHROMA JOURNEY | POLYMASTERS

UNIQUE SELLING POINTS

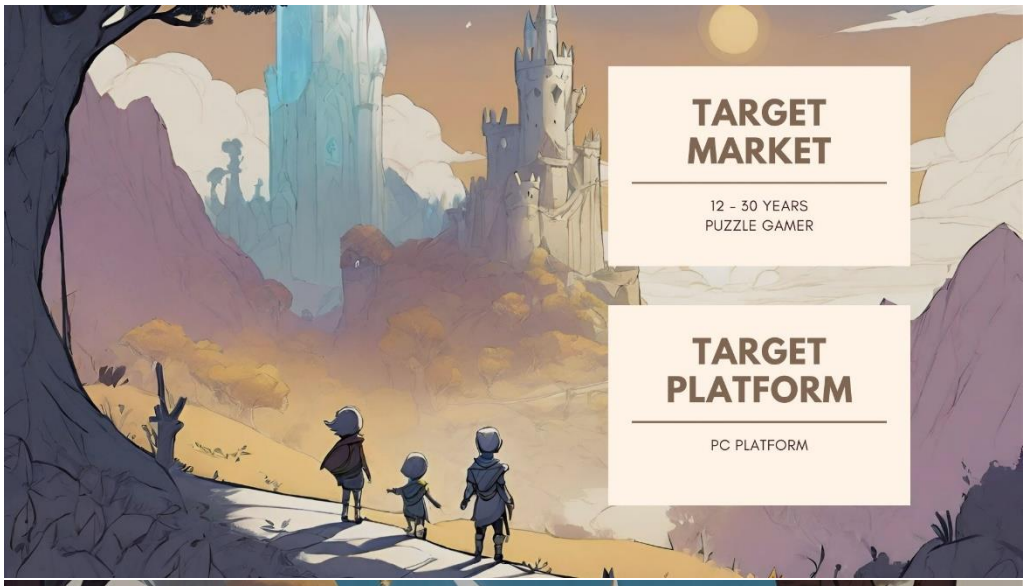
ANIMAL RELATED PUZZLE

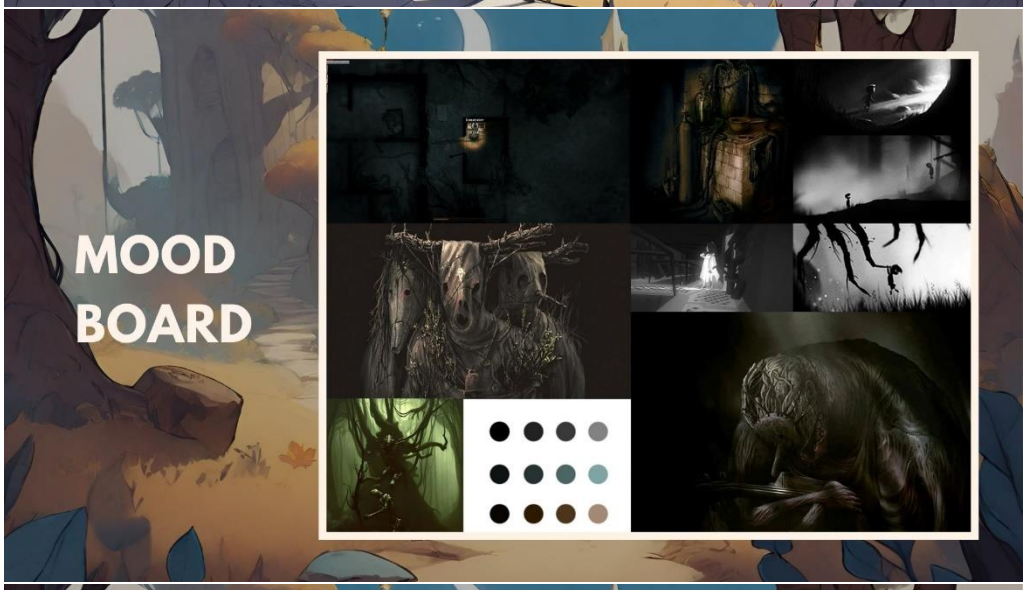
The help from animal puzzle stands out as a unique gameplay from a normal puzzle game.

LIGHT SOURCES MECHANIC

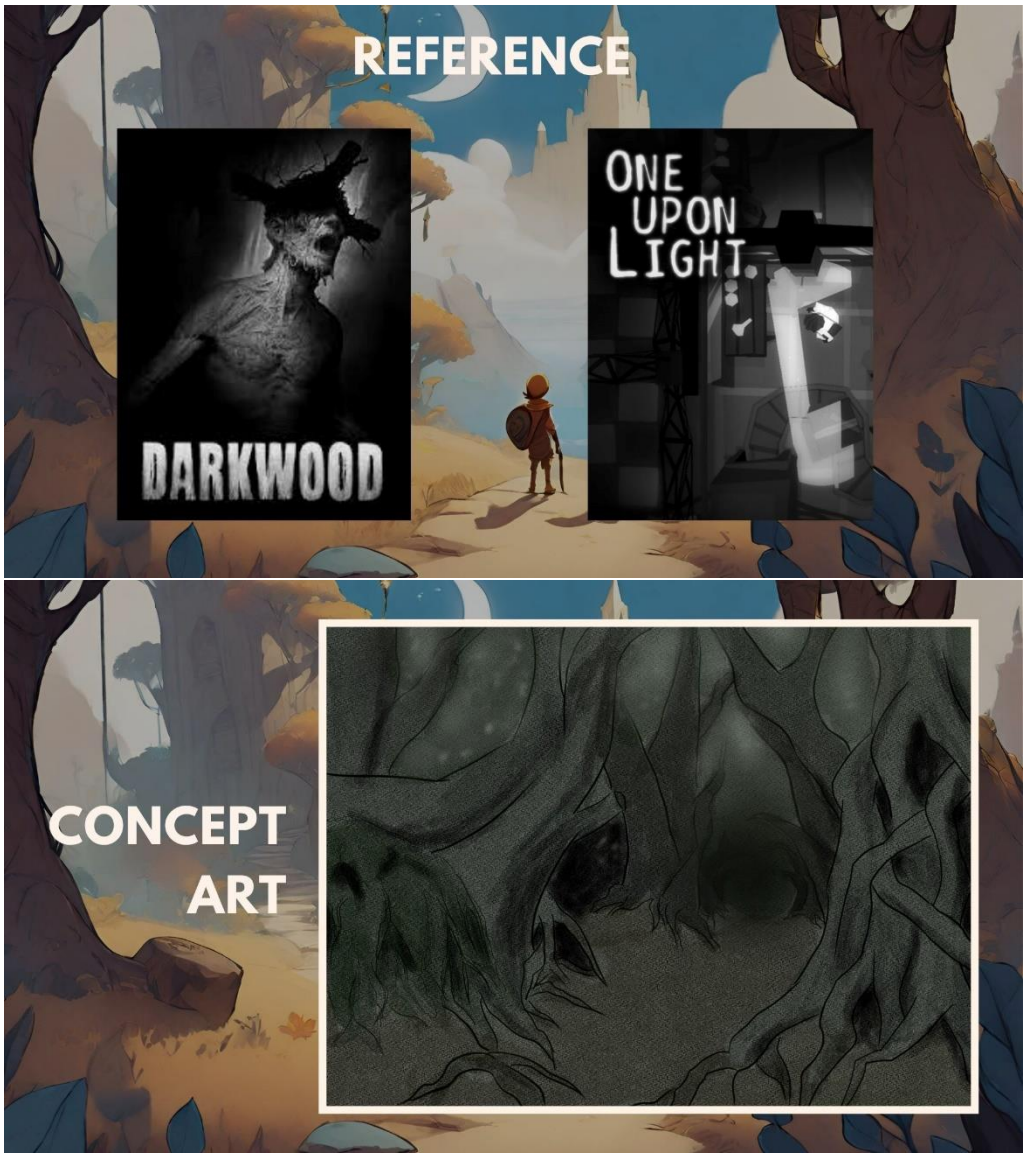
Light sources in the environment keep players safe and create a creative thinking playtime of **how players plan to use their light sources.**

CHROMA JOURNEY | POLYMASTERS

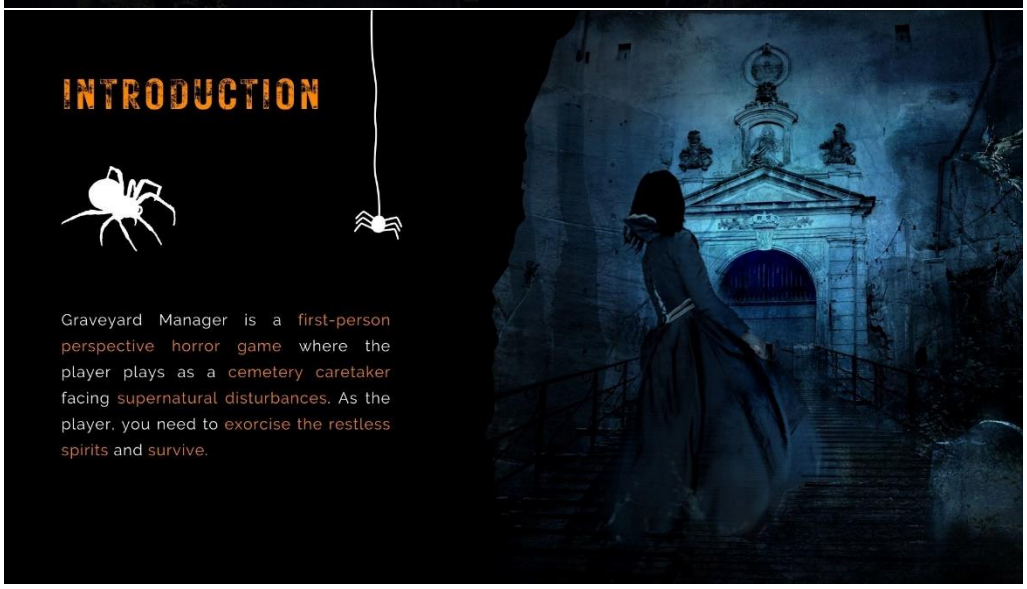

TARGET MARKET
12 - 30 YEARS
PUZZLE GAMER
TARGET PLATFORM
PC PLATFORM


MOOD BOARD


CHARACTER SKETCH


REFERENCE
DARKWOOD
ONE
UPON
LIGHT
CONCEPT
ART

Appendix C: Second Game Idea Proposal Presentation Slides (Graveyard Manager)



GAME GENRE

Horror

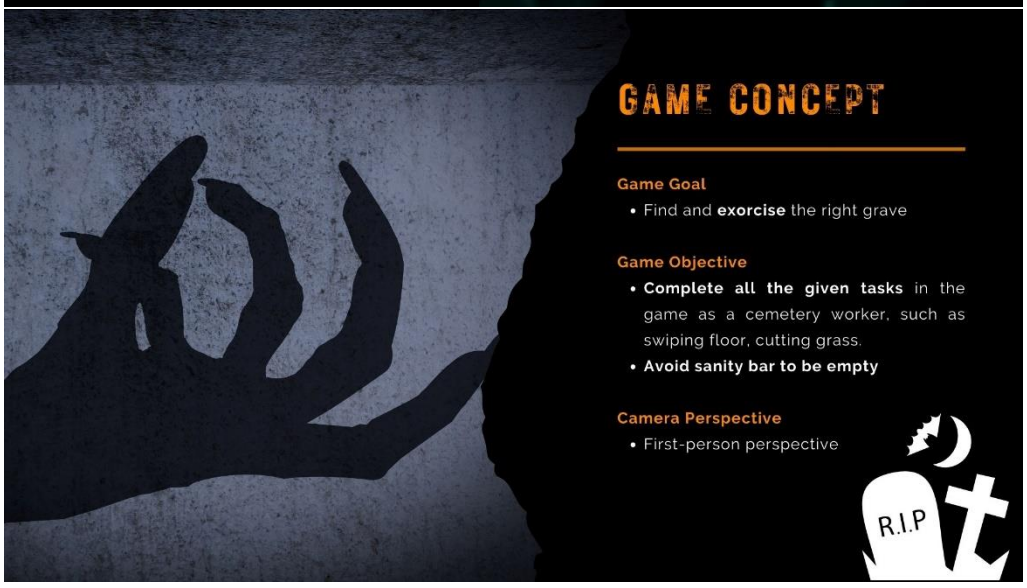
ART STYLE

High Poly 3D

Dark

GAME STORY

Ming is a poor teenager who **desperately needs money**. He found a **high-paying job** that required him to **work at night in a Chinese cemetery**. Ming applies for the job, and this is his **first night** working in the cemetery. He is given the task of **cleaning up the cemetery** and **maintaining it at night**. However, Ming starts to see **something strange** that he cannot explain happening around the cemetery. It becomes **increasingly common** as time passes. He feels **creepy** and tries to finish his tasks quickly.



GAME CONCEPT

Game Goal

- Find and **exorcise** the right grave

Game Objective

- **Complete all the given tasks** in the game as a cemetery worker, such as swiping floor, cutting grass.
- **Avoid sanity bar to be empty**

Camera Perspective

- First-person perspective

GAME CONCEPT

Gameplay

- Player explores only **1 level** which is the **cemetery map**
- Leads to **3 different endings** depending on the player's **performance** in game
- **Clues** will be given when the player is doing tasks, exp: the grave with the most frequent or obvious **supernatural event** is most likely the grave player needs to **exorcise**

GAME CONCEPT

Gameplay

- The player will have a **sanity bar** slowly decreasing
- **Pray** in shrines using **incense stick** to restore sanity
- Incense stick is **limited** (means **time is limited**)
- Endings will be told via cutscene

ENDINGS

ONE: Survive the night

- The player exorcises the **correct grave**

TWO: Fail to survive

- The player exorcises the **wrong grave**

THREE: Possessed

- The player's **sanity bar** is **empty**

UNIQUE SELLING POINTS

- Horror game with **Chinese cemetery theme** is not usual in the market
- Promote **Chinese culture about death**
- Able to see the **ghost appearance in Taoism** (religion)

TARGET MARKET

18-25 years old computer user

Horror game fans

TARGET PLATFORM

PC platform

SKETCH

Ghost in game

CONCEPT ART

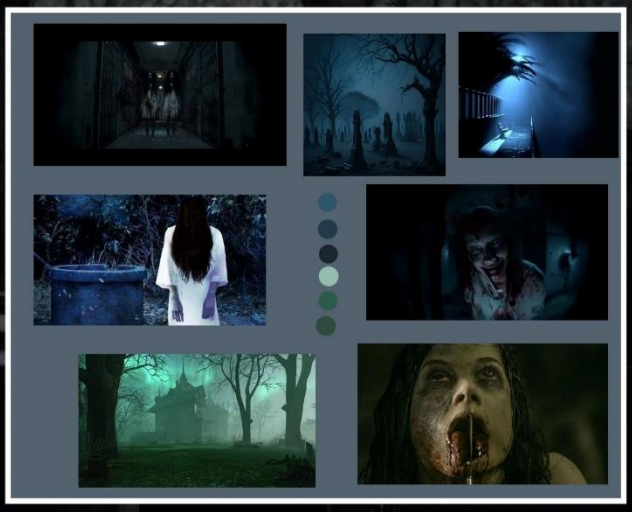
Cemetery

MOOD BOARD

Horror

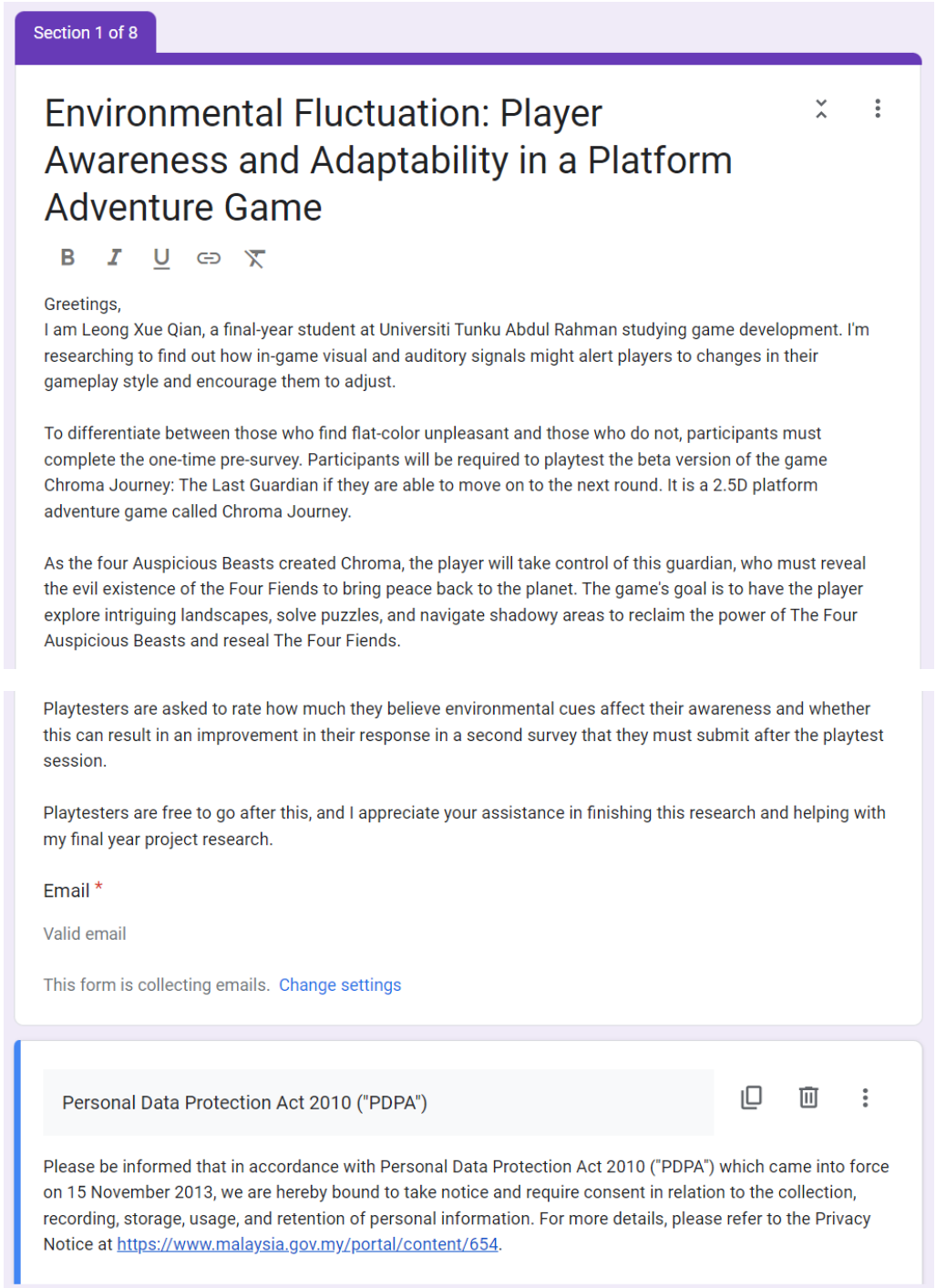
Creepy

Cold



Reference

Appendix D: Survey Form



Section 1 of 8

Environmental Fluctuation: Player Awareness and Adaptability in a Platform Adventure Game

Greetings,
I am Leong Xue Qian, a final-year student at Universiti Tunku Abdul Rahman studying game development. I'm researching to find out how in-game visual and auditory signals might alert players to changes in their gameplay style and encourage them to adjust.

To differentiate between those who find flat-color unpleasant and those who do not, participants must complete the one-time pre-survey. Participants will be required to playtest the beta version of the game Chroma Journey: The Last Guardian if they are able to move on to the next round. It is a 2.5D platform adventure game called Chroma Journey.

As the four Auspicious Beasts created Chroma, the player will take control of this guardian, who must reveal the evil existence of the Four Fiends to bring peace back to the planet. The game's goal is to have the player explore intriguing landscapes, solve puzzles, and navigate shadowy areas to reclaim the power of The Four Auspicious Beasts and reseal The Four Fiends.

Playtesters are asked to rate how much they believe environmental cues affect their awareness and whether this can result in an improvement in their response in a second survey that they must submit after the playtest session.

Playtesters are free to go after this, and I appreciate your assistance in finishing this research and helping with my final year project research.

Email *

Valid email

This form is collecting emails. Change settings

Personal Data Protection Act 2010 ("PDPA")

Please be informed that in accordance with Personal Data Protection Act 2010 ("PDPA") which came into force on 15 November 2013, we are hereby bound to take notice and require consent in relation to the collection, recording, storage, usage, and retention of personal information. For more details, please refer to the Privacy Notice at https://www.malaysia.gov.my/portal/content/654.

Section 2 of 8

Section 1 - Demographic

This section is to differentiate between those who find flat-color unpleasant and those who do not.

How old are you? *

1. Below 20
2. 20 - 29
3. 30 - 39
4. 40 -49
5. 50 - 59
6. Above 59

Do you like flat-color game? *

The image shows a Journey gaming scene with a flat color scheme. It describes a visual style in which solid, unshaded colors are used to represent objects or characters.

- ○ Yes
- ○ No
- ○ Maybe

Section 3 of 8

Section 2 - Playtesting

Kindly download from Chroma Journey (Beta File) in order to obtain the game beta. Please watch the teaser before playtesting.

Game Teaser

Section 4 of 8

Section 3 - Post-survey

In this section, playtesters are asked to rate how much they believe environmental cues affect their awareness and whether this can result in an improvement in their response.

Game Overview

Description (optional)

Do you expect that there will be different level concepts as you progress from one level to the next due to the changing environment? *

- ○ Yes
- ○ No

Justify your response above. *

Long answer text

Section 5 of 8

Section 3 - Post-survey

In this section, playtesters are asked to rate how much they believe environmental cues affect their awareness and whether this can result in an improvement in their response.

Forest Level - Qiongqi

Have you observed that as the level loaded, the ambient sound went missing? *

- Yes
- No

With the complete loss of ambient sound, do you feel the sound system is affecting the gameplay? *

If you answered NO, please respond to the following question.

- Yes
- No

Please provide feedback on how to improve the game design for this forest level in order to let the players know sound is affecting the gameplay.

Long answer text

How well do you believe the game's environmental cues alert you to the challenges and helps you adjust more quickly? *

	1	2	3	4	5	
Poor	○	○	○	○	○	Excellent

Section 6 of 8

Section 3 - Post-survey

In this section, playtesters are asked to rate how much they believe environmental cues affect their awareness and whether this can result in an improvement in their response.

Lake Level - Taotie

Have you observed that as the level loaded, the atmosphere fills with poisonous gases? *

- ○ Yes
- ○ No

Do you believe that, as time passes, the poisonous gases will have any effect on the player? *

- ○ Yes
- ○ No

Are the enemies that first emerge a hint to the player about how this level will be played, in your opinion? *

- ○ Yes
- ○ No

Please provide feedback on how to improve the game design for this lake level so that players understand that the enemy sees everything as eatable and so attacks all living things.

Answer this if you responded NO to the previous TWO questions.

Long answer text

How well do you believe the game's environmental cues alert you to the challenges and helps you adjust more quickly? *

	1	2	3	4	5	
Poor	○	○	○	○	○	Excellent

Section 7 of 8

Section 3 - Post-survey

In this section, playtesters are asked to rate how much they believe environmental cues affect their awareness and whether this can result in an improvement in their response.

Cave Level - Hundun

Have you noticed that as the level loaded, the background was hazy and dark, with just crystals showing flashes of light? *

- ◯ Yes
- ◯ No

Do you believe that this level revolves around light, given that the only light comes from crystal? *

- ◯ Yes
- ◯ No

Do you ever wonder why the enemy clones are all gathered near the crystal? *

- ◯ Yes
- ◯ No

Please provide feedback on how to improve the game design for this cave level in order to let the players know light is affecting the gameplay.

Answer this if you responded NO to the previous TWO questions.

Long answer text

How well do you believe the game's environmental cues alert you to the challenges and helps you adjust more quickly? *

	1	2	3	4	5	
Poor	○	○	○	○	○	Excellent

Section 8 of 8

Section 3 - Post-survey

In this section, playtesters are asked to rate how much they believe environmental cues affect their awareness and whether this can result in an improvement in their response.

Boss Level - Taowu

Do you think the shift from color to a greyscale environment hints that this level will revolve around color? *

- ○ Yes
- ○ No

Do you see the circle over the boss' head and seal stones as a progress bar? *

- ○ Yes
- ○ No

Do you think the camera shake when the platform rises is a cue to take another action rather than continue sealing the stone? *

- ○ Yes
- ○ No

Are you aware that there are other seal stones to seal after the initial stone has been sealed because the environment regaining some of its color? *

- ○ Yes
- ○ No

Please provide feedback on how to improve the game design for this boss level in order to let the players know the game goal of sealing all balls back to the stones.

Answer this if you responded NO to the previous THREE questions.

Long answer text

How well do you believe the game's environmental cues alert you to the challenges and helps you adjust more quickly? *

	1	2	3	4	5	
Poor	○	○	○	○	○	Excellent

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
2101503	Leong Wan Yi	leongwy1103@gmail.com +6017-891 4905
2001345	Leong Xue Qian	qianxue.jane@gmail.com +601136618226
2100171	Ho Keen Mun	robert2@gmail.com +6016-229 8270
2003878	Wong Zi Ming	zimingwong2@gmail.com +601151284354

Supervisor: Ms. Chow Mee Mooi

Project Title:

Chroma Journey: The Last Guardian

Project description:

Chroma Journey is a 2.5D platform adventure game where the player will play as a guardian named Chroma, whom the four Auspicious Beasts created. The player is given an enormous task: unveiling the terrible presence of the Four Fiends. Throughout the game, the player has to travel to fascinating landscapes, solve puzzles, and traverse shadowed regions to restore harmony to the world.

Student Name	Individual Project Scopes
Ho Keen Mun	• UI arts • Cutscenes • Player and enemy character models and animations
Leong Wan Yi	• Player movement and behaviour • UI functions • Visual Effects • Item interaction • Game environmental change functions
Leong Xue Qian	• Enemy AI functions • Main menu Functions • Game mechanics implementation
Wong Zi Ming	• Concept arts of the entire game • Levels and game environment designs • Sound effects and background music