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Impact of Level Design on Player Engagement in Horror Games

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Abstract- Level design has a very important role in games that make the player feel present, especially in horror games where the setting, suspense, and the tempo of the game are the basis of players' engagement. The present study investigates what the specific elements of level design for horror games are and how they affect the player engagement. Using the existing literature and player feedback the research is centered on the organization and coherence of space, lighting, environmental storytelling, and pacing as the main components of the design. The mixed-method research design that presented in the paper involved different approaches such as gameplay observation, survey data, and player interviews all of which were used to analyse emotion and player experiences from various design choices.

The results show that the prison-like passage, changing the lighting, and the plot were all strong contributors to the fear and the feeling of being in the game; and these lead to very high engagement. The research paper closes with the presentation of the recommendations for the design that will make horror environments challenging and loaded with emotion.

Keywords- Keywords: Level Design, Player Engagement, Lighting, Game Environment

I. INTRODUCTION

Games representing the horror genre occupy a very special place in the gaming industry as they mainly try to evoke emotional reactions of fear, anxiety, and suspense. The elements of horror games that affect their overall effectiveness are numerous, but surely level design is their main driving force. Game space structure, including factors such as their layout, scale, lighting, and progression, has been proven to be the most critical variable of them all as it can either effectively strengthen or weaken the mood of the game. In this genre, proper level design is a condition not only for facilitating gameplay but also for creating the psychological landscapes that affect the player's expectations, emotions, and reactions. Utilizing spatial arrangement and environmental clues, a continuous state of anxiety and discomfort are induced within the players, which in turn results in a deeper orientation within the game's world.

Here, the researcher delves into the relationship between level design and player engagement in horror games. Engagement is defined herein as the extent to which players are both mentally and emotionally involved in the ongoing gameplay. The research raises the following question: How do the particular elements of level design enhance the players' engagement in horror games? To this end, we identify and explain the main features of level design that are applied in popular horror titles, conduct a survey with players in which the participants provide relevant qualitative and quantitative data, and from this, we formulate ideas about the design strategies that provide the greater level of emotion and player satisfaction. This aspect of the study is further elaborated by focusing on the examination of the flow of the game world, the appropriate location of enemies, the details that

reveal the game location, and different interactive narrative aspects.

To establish the link between emotional and spatial design, this paper is intended to cast light on aspects that can help to develop games which are horror in nature, more interesting for users. The gained results are supposed to make a positive financial and educational impact both on game developers and academia, by the way of being a source not only of recommendations but also of paradigms for carrying out further research design studies. Also, the intention of the current study is to outline the terrain between the application of practical levels and also the theoretic model of the player's engagement, where the key point is how the audience allows the game to be played and what types of interactions are there.

II. LITERATURE REVIEW

The study of game theory and game design through the available literature presents a solid base for investigating the connection between the level design of a game and the engagement of players, which is especially evident in horror games. In particular, scholars, for example, Perron (2018), stress how horror games are primarily spatial and environmental storytelling. This means that the player is drawn into the game through its environment and the subtle details of a cave wall, color of shadows, or the footprint of an old chair contribute in this kind of narration.
Corridors, open spaces, hidden areas, and especially room design are the main areas that game players interact with in a horror game. This is where the game developers are most strategic because wandering and combat start in these areas. These spatial forms actually have more psychological power instead of jump scares since they cause players to act and think unconsciously and automatically.

In the view of Rouse (2005), the design of levels should instigate behavior in the player in an indirect way, so noise, light, and the overall environment need to be involved to contribute to the overall experience. Most games that belong to the horror genre apply this rule of leading the player to a sense of both safety and danger. Creating levels without any clear path (like a maze) or misplaced end increases the tension levels and stimulates the feeling of a personal presence. Reducing the range of vision and limiting a player's movements only result in an increase of their fear as this has been already empirically tested.

Nitsche (2008) explains the direct link between lighting and visibility and the emotional effect of the design of the level. Furthermore, he mentions that if people feel clueless about what a place contains, that makes them scared. He describes the shadows, the limitation of the visibility, and the unexpected changes in the intensity of the light as elements which make the feeling of vulnerability to be very high.

In the same direction, the core gameplay concept. The term "flow" formulated by Csikszentmihalyi's (1990) and Sweetser and Wyeth (2005) described it as the foundation of the gaming world. The new model postulates that when there is a balance between a challenging task and one's capacity to perform, the players get involved most. An experiment of horror games concludes that the setting of a level may be a factor that disrupts the balance between the challenge and the skill of the player by offering different types of obstacles, puzzles, and enemy encounters in order to establish and definitely know if this balance is still there. Thus, the pace and reward distribution are two foremost things that should be count on to keep the equilibrium.

Jennett et al. (2008) introduced the Experience Questionnaire (EQ) which was created to measure a user's engagement, enjoyment and flow experience in MMORPGs. This study confirms that the change in game landscape design, the core part of a video game, really boosts gamers to get deeper into the game, to dedicate themselves totally to the task. It underlines the common point of the importance of the design of the game from the different investigations' statements by defining that the surroundings are no longer the sidekick of the horror story, but the proactive part, as well as the player.

Furthermore, the most recent discoveries have examined how digital places of horror games only reflect real-world fears and anxieties and show the use of the game level inner layout as a means of psychical projection. The interaction of the user's influence with the environmental narrative i.e. inclusion of many paths, hidden facts, and unforeseen outcomes, has been acclaimed as a decisive element in the total steam of events. The creation of levels that are conductive to the so-called emergent phenomena and that allow the user to experiment with them in the long term can generate the so-called cognitive engagement process fully. Recent research has also shown that when the touchy sensations and audio signals are contextualized with the spatial layout, the player's senses are awakened and fear is in an attempt to be incarnated further. The writing of the paper reveals the new ongoing trends in the genre, in particular, the appliance of randomness, and the provision of VR, because they are possible triggers for creating horrifying ambiances as they get studied thoroughly by researchers. On the one hand, it has been revealed through different studies that horror video game genre as a field of production is a cross-discipline venture that draws on the expertise of such fields as architecture, psychology, and the interactive media, for it to be able to hold the interests and affect the emotions of the player fully.

Additionally, the literature addresses the emergence of a big change in thinking about how levels of games need to be designed so they can adapt to the player's behaviors in real-time (adaptive design). An environment that is able to react to the actions of the players in a short while was proven to be able to increase the game's convenience and entertain the player by not allowing predictions. The biometric feedback issue—linked with heart rate and eye-tracking to assess the horror level design and so as to adjust pacing and tension dynamically—together with these new technologies is the way for horror games not to rely solely on jump scares but give more personal and responsive experiences. This coalescence marks the dawning of a new age, where historical enabling technologies hit cutting-edge reality, by showing that, in horror games, level designs are the churn of engagement that is dynamic and that keeps the player robotically hooked through personalized and exciting features.

III.RESEARCH METHODOLOGY

A mixed-method research design was employed to determine the relationship between level design and player engagement in horror games. This method incorporates the data collected through surveys with personal interpretations based on a qualitative research method which is the observation that follows the gameplay and post-interview sessions. The purpose was to gather both numerical proofs and subjective stories of individuals to recognize the impact of level design on the player's mind in horror games.

1. Participants A total of 40 participants were involved in the study, with an age range of 18-30, of which the casual and experienced gamers were balanced. All participants were experienced in playing horror games and had already played at least 2 major horror games, such as Amnesia: The Dark Descent, Outlast, Silent Hill 2 or Resident Evil 7. The variety in the experience of the participants was very important as it is a direct tool to see how the degree of their familiarity with various design elements differently affect emotional and cognitive reactions to the elements of games.

2. Procedure Participants were required to play some parts of the horror games that had been chosen. While they were playing, both the screen recording and the observation of their behavior took place to get insights about their emotional and physical reactions. After the gameplay, the respondents then participated in the survey that made use of the Likert scale for measuring immersion, tension, fear, and satisfaction. This was followed by a detailed dialogue, in which the participants were encouraged to talk about those level design features of the game which had the greatest influence on the degree of their engagement. Each session had a duration of 60-75 minutes and was performed in a setting where there were virtually no distractions.

3. Tools and Techniques The research made use of gaming interfaces (Unity and Unreal Engine) to design sample levels for various features like lighting, spatial layout, and progression structure. In addition to this, the Immersion Questionnaire (IQ) created by Jennett et al. was used with or without modification for the needs of horror gaming, which then allowed an in-depth and more coherent measurement of the arousal phenomena of the players. Furthermore, the process of data analysis encompassed the transformation of interview transcripts into coded themes and the use of software like SPSS to make countable and visual the survey results. The combined dual analysis not only gave a quantitative report but also presented a rich experiential basis for the evaluation of the influence of level design.

4. Ethical Considerations Before the research was initiated, ethical approval was acquired. The study's nature and their rights, as well as the option of discontinuing at any time, were all described to the subjects. Concerning the primary data, all data were no names attached to keep the subjects' identities protected, and permission was also asked for the recording of both the gaming observation and the interview. The research followed the ethical principles safeguarding the human subjects, proving honesty, humility, and confidentiality.

5. Reliability and Validity To ensure the consistency and reliability of the method, the study was employing the same sets of procedures as well as allowing for playing seconds to be identical so that the independent variable does not affect the output of the experiment. Thematic analysis was performed by multiple raters thus improving the reliability. Source triangulation was the procedure for ensuring the validity of the study where a set of surveys, open-ended questions, and gameplay videos were used in an inquiry. The approach used in this study to gather and report the data validates the accuracy and applicability of the outcomes.

6. Limitations Although the research was exhaustive, some restrictions need to be recognized. The totality of the sample was adequate; however, it was small and restricted to a certain age category that might not entirely reflect the gaming population at large. Also, using pre-selected gameplay segments might have elicited different experiences for the participants as opposed to full-length playthroughs. In the future, the study can be widened by including a variety of people in the sample and using methods such as longitudinal studies to see how players' engagement changes over time.

7. Data Coding & Analysis The qualitative date from interviews were transcribed and then analyzed through a thematic approach by using the qualitative data analysis tool NVivo. From the participants' answers, the codes have been extracted through an inductive process and grouped into recurrent themes like "fear triggers", 'environmental tension', 'navigation uncertainty', and 'emotional pacing'. Descriptive statistics and correlation tests in SPSS formed the backbone of the quantitative survey data so that engagement was studied in relation to the design variables and patterns were detected through the tests conducted.

8. Sampling Technique The technique of purposive sampling was used to choose those participants who had prior contact with horror games. Thus, it was aiming at the receipt of more informed and contextually relevant feedback. Moreover, the participants were divided based on their frequency of playing, game genre preference, and their familiarity with the horror game mechanics to allow the research to discover the patterns of various gamer profiles.

9. Research Setting and Preparation The play sessions were held in an isolated, majority-darkened room with soundproofing arranged to simulate the immersive circumstances of the game horror. The participants employed high-quality headphones and standard gaming peripherals in each session to guarantee the consistency of their experience throughout the studies. The environment's temperature, humidity, air pressure, and other external variables were strictly controlled.

IV. Data Analysis and Findings

Among the main findings of the survey, interviews, and gameplay observation, the data are the several patterns that stand out as the king construction of the level affects the player's immersion making in horror genre. The most important result of the investigation was the combination of qualitative subjective opinions and numerical value ratings for the categorization of specific design elements that provoke the strong emotional attachment and fear response.

1. Spatial Confinement and Navigation

One of the most significant findings in this whole research work was the influence of spatial confinement. It was communicated by the gamers that the mod there was, the more limited space; the more suspense was in their virtual journey. The results of the study show that over 75% of the experimental group of players confirmed that they were more anxious when they were unsure of the route, especially in the cases where the environments had dead ends or looping paths. The authors also noted that the data from the players' on-site observation indicated a significant portion of the players hesitating to move from one point, moving much slower, and in some cases, feeling visibly disturbed at the scenes of limited space. The authors draw the conclusion, therefore, that the limited navigational clarity serves not only as a potential epitome of dread, but it also tempts the ferry of uncertainty and vulnerability our minds.

2. Lighting and Visual Cues

The lighting was indicated as another potent instrument for the management of emotions. The high contrary percentages that the dynamic changes in light lead to lesser immersion among the 77 players are then very indicative of the outcomes of the research. It was my first time to experience 82% of the experiment's participants. In this study, we found out that the players were scared of places that had only fire lights such as candles and torches, and, overall, those were dimly lit. Therefore, the statement that it is the lighting which actually sets the tone is valid, and also, it's true, that in addition to being a strong factor of narration, lighting is also used as a guide in the game, discretely. Like this, apart from its function as narrative and mechanical, it is also an indispensable tool for horror level design.

3. Environmental Storytelling

Players were constantly getting good feedback when playing the levels that were filled with environmental storytelling, such elements as the notes that were carefully thrown away, audio logs that were weird and scary, blood stains and shattered furniture, and broken furniture in a room led to a new level of emotional investment. More than 70% of participants preferred storytelling through exploration rather than cutscenes, highlighting the value of implicit narrative in working with the horror level design process. These passive cues enabled players to figure out the whole story, which established a sense of agency and immersion. The type of design not only entices players to explore with caution, but it also allows an increase in engagement and tension at the same time.

4. Pacing and Threat Design

It has been demonstrated that levels with a slow buildup of the pacing followed by sudden threats are much more engaging than those with constant or predictable scares. For example, games such as Silent Hill 2 that had quiet, non-eventful corridors were the ones where one could not help but find unexpected moments of horror and previously enjoyed games. This kind of pacing was making the tension build up slowly that facilitated a higher emotional climax for the players. Predictable pacing, on the other hand, would be the greatest cause in the reduction of fear responses and induction of disengagement. It was clearly one of the player's statements and that an efficient rhythm amongst quietness and chaos contributed to the game's most fascinating and replayable aspects.

These findings as a whole underscore the importance of integrating specific level design elements which, when mastered properly, cultivate a new and high level of player engagement by influencing the gamut of emotions experienced in subtle and imperceptible ways and by regulating the behaviour of the players. Skilfully thought-out horror levels are sustained partly by play with

environmental pressure, manipulation of space, and verbal and visual depiction of the story.

V. CONCLUSION

The investigation ratifies the fact that level design is one of the primary reasons for the engagement of the player in the horror games. The papers also talk about the things that magnetize the players. They include spatial confinement, dynamic lighting, environmental storytelling, and pacing that generate deep and complex feelings in the: that contribute to emotional immersion and sustained gameplay interest. Each of these elements allows for the creation of the absolutely perfect horror gaming experience that is going to be hard to forget by the players. In other words, if all these factors are put in the right order, the players' psychological issues are the ones that are affected, namely, to the extent of producing more intense and memorable horror experiences.

It is about time to see level design in horror games not as a category of logistics or artistry but as a part of the strategy of psychology. The priority for the designer is to create space for uncertainty, fear, and the spirit of curiosity. The task is to have moving and interactive worlds with lots of hints, suggestions, and challenges of which only some would be confirmed. The light source has a two-fold purpose where it helps in indicating the right path while making sure that there is tension. Also, the writer wants to communicate through main plot twists that are only discovered if one explores the story purposefully. The creator can choose to share the lesson at an engaging moment, engage learners with material for playful discovery, or make students demonstrate the steps through a simple graphic organizer or body movement. When a quiet or low sound quality is combined with the faded elements of a space it enhances the atmosphere and the horror that the audience can feel simultaneously.

In the future, more research should be directed towards investigating the influence of VR on horror games level design and more so sound. They are also channels through which new perception and emotional manipulation can take place. Eventually, the studies representing each region of the world may imply the different reactions that various cultures have to horror in space, so to build a worldwide picture of the fear pattern would be possible. The present study aims to give game developers the knowledge of creating not only scary but also order through fear games on a psychological level. Along these lines, both indie and big publishers seeking to explore interactive horror storytelling must inculcate these findings for the intended result.

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