

Analysis of Flow in Emotionally-oriented Games

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Abstract: This paper explores the role of flow theory in emotionally-oriented games, and analyzes its impact on game design and user experience. According to flow theory, players enter a state of flow during play, marked by control, emotional depth, skill challenge, clear goals, and immediate feedback. The study designed a hypothetical game, *Tidal Emotional Chaos*, to induce flow through empathy and mechanics. Due to the early design phase, data was collected through a questionnaire of the player's expected flow effects. The results show that players often experience flow in emotional games, especially immersion and skill challenges. However, some reports lack immediate feedback and self-awareness, indicating the need for improved design. Emotional resonance and storytelling are popular, but user interfaces and feedback can be more effective. In conclusion, while emotionally oriented games are effective at providing flow and emotional experiences, there is still room for improvement, especially in terms of immediate feedback and user interface design, to further improve the gaming experience for players.

Keywords: Flow Experience, Emotionally-oriented Games, Human Computer Interaction, Game design

1. Introduction

Well-designed games often provide the player with a sense of control over their actions in the virtual world, and this sense of control gradually leads the player into a special state called flow as the game progresses [1]. In this state, the player's emotions are deeply connected to the game in the form of skillful and challenging actions, coordination of actions and awareness, clear goals, immediate feedback, focus on the task at hand, and a temporary loss of self-awareness. When players review and discuss their emotional experiences in games, the words they use are mostly related to flow states, such as curiosity, excitement, challenge, pride, and inspiration. Flow theory is therefore an important tool for understanding the unique emotional power of games compared to other mediums.

The purpose of this paper is to provide a brief overview of flow theory and emotionally-oriented gameplay, and to explore the possible impact of flow on game design and user experience in the form of game design and questionnaires. In this way, this article seeks to explore the role of flow experiences in emotionally oriented games, and how such experiences affect the player's overall gaming experience. This kind of research not only helps game designers better understand how to create engaging gaming experiences, but also provides a new perspective on the uniqueness of games as an emotional medium.

2. An overview of Flow Theory

Csikszentmihalyi claims that when an individual is engaged in an activity, they are so completely immersed in it that their surroundings no longer attract their attention, and they feel that the action is fluid and automatic, usually accompanied by a sense of rapid time passing and a strong sense of pleasure and satisfaction. In a flow state, the individual reaches the peak of concentration, becomes less susceptible to external distractions, and self-awareness and anxiety fade away, focusing only on the current activity and the experiences associated with it [2].

Flow Theory includes the following core elements:

Balance of challenge and skill: Flow experiences often occur when an individual's skill level is balanced with the challenge of the task at hand. If the task is too easy, the individual may get bored; If it's too difficult, they may feel anxious [3].

Clear goal: In a flow experience, the individual usually has a clear goal, which can be an intrinsic or extrinsic goal of the activity itself [4].

Immediate feedback: In the flow state, individuals typically receive immediate feedback on their performance, which helps them adjust their operations to maintain the flow experience [5].

Focused attention: In the midst of a flow experience, the higher the concentration of an individual, the less attention they pay to matters outside of the task at hand [6].

Loss of self-awareness: During flow experiences, individuals often lose their sense of self and focus only on the activity in the moment. The perception of time has also changed, and people often feel that time passes unusually fast [7].

A sense of control: In a flow experience, the individual perceives a sense of control over the operational activity, even if the task itself is challenging [8].

Self-serving: In the flow experience, individuals perceive the activity as inherently rewarding, engaging in the task not for external rewards but for the satisfaction it provides [9].

3. Emotionally-oriented Game Characteristics and Design Principles

3.1. Features

Emotional experience as the core: Emotion emphasizes the emotional experience of the player to the game, through the game graphics, scene atmosphere, game mechanics, level design, narrative, player and NPC interaction and other aspects of the design, to give the player a rich emotional experience [9]. In emotional games, emotion is often the primary emotional variable, but the overall game experience also has a considerable relationship with emotional states such as mood or attitude [10].

Emotional resonance: This type of game focuses on the character design to arouse the resonance of the player, such as the role and identity close to the real player image, so that the player has a feeling of "like me" or "I have seen him".

Emotionally driven narrative: The progression of emotions into the story of the game should include emotional variations that allow the player to experience the emotional ups and downs of the game, be moved by the story, and be attracted to the plot.

User interface and feedback: Bødker, Christensen, and Jørgensen [11] define the term emotional design, arguing that emotional interface and its design is an aesthetic discipline capable of arousing specific emotions in users. The game uses color and animation to convey an emotional atmosphere, and provides instant feedback, such as the character's facial changes, to enhance the player's emotional experience.

Cross-cultural considerations: Considering that different cultures have different understandings of emotional expression, emotion-oriented games are designed with diversity in mind, using different ways of emotional expression, such as body language, sound effects, environmental changes, etc.

Technology realization: Using facial capture and animation technology, as well as artificial intelligence technology, to make the emotional expression of characters more realistic, creating a personalized and immersive game experience.

3.2. Design Principles

Character design and facial expressions: Design a variety of character expressions to increase the sense of engagement, such as the character in different situations to show pride, anger, sadness and other expressions.

Emotional decision points: Allowing the player to make choices at critical moments increases interactivity and gives the player a sense that their choices affect the direction of the story.

The integration of emotional elements of UI design: Use emotional interface design, such as fast flashing red elements for tense scenes and warm yellow lights for relaxing scenes.

Instant feedback: When the player makes an action, the character's expression should respond immediately, the character cheers when he succeeds, and the character looks frustrated when he fails, so that the player feels that his behavior is really affecting the game world.

Cultural sensitivity: Design takes into account different cultural interpretations of emotional expression and adjusts them to be acceptable to global players.

Diverse expressions of emotion: In addition to facial expressions, emotions can be expressed using body language, sound effects and even environmental changes, so that players from different cultures can understand emotional signals.

Types of emotional labor: According to Maslow's hierarchy of needs theory, emotional labor can be divided into experiential labor, consumption labor and output labor, reflecting different levels of human needs [12]. Experience labor is associated with basic physiological and safety needs, consumption labor is aligned with social and respect needs, and output labor corresponds to self-actualization needs at the top of the hierarchy.

Emotional and social play: One of the core differences between online games and single-player games is the introduction of social relationships, which can be acquaintances or strangers. Research has shown that social interaction in a gaming environment significantly amplifies emotional experiences due to the presence of others. The three building blocks social game designers use to evoke emotional feedback from players are: coordinated actions, role playing, and social scenarios. These elements are crucial because they promote collaboration, encourage players to embody different personas, and create dynamic social environments that lead to a range of emotional responses.

4. The Relationship between Flow Experience and Emotional Experience

4.1. Positive Emotional Experiences

Flow experiences are usually accompanied by positive emotional experiences. When individuals are fully engaged in an activity and achieve a subjective state of self-oblivion, they tend to feel excitement and a sense of fulfillment. This positive emotional experience is an important feature of the flow state.

Emotional resonance: As experienced during flow, high levels of attention and engagement with an activity can trigger a strong emotional response, highlighting the interplay between cognitive absorption and emotional experience [13]. This resonance may be related to the content, role, or context of the activity, making the individual feel a strong emotional connection to the activity.

Deep enjoyment of emotion: The flow experience is not just a cognitive focus, it also involves deep enjoyment and satisfaction with the activity itself. This deep enjoyment is an intense emotional experience in itself.

4.2. The Effect of the Flow Experience on the Emotional Experience

Increase happiness: Flow experiences enhance individual happiness and self-fulfillment. The sense of satisfaction and accomplishment that individuals experience in a flow state can significantly increase their life satisfaction and happiness.

Increased intrinsic motivation: The pleasure and satisfaction of flow experiences make individuals more willing to engage actively, without the need for extrinsic motivation. This intrinsic motivation enhances the individual's continued participation and emotional investment in the activity.

Increased stress resistance and resilience: Flow experiences help individuals cope with stress more effectively. In a flow state, the brain is not overly focused on negative emotions, but is focused on the completion of the task, thus improving the individual's resilience and resilience.

Build self-confidence and self-efficacy: By getting into flow and completing challenging tasks, individuals can build self-confidence and enhance their sense of self-efficacy. This sense of self-efficacy not only has a positive effect on current activities, but also extends to other areas of life, affecting individuals' emotional states and behaviors.

Positive changes in emotions: The results of flow experiences include positive emotions and purposeful experiences. This means that flow not only affects the emotional state at the time, but can also lead to long-term emotional changes that make individuals more emotionally positive and purposeful.

5. Research Method

The study designed a game called *Tide of Emotional Chaos* to increase immersion and create the flow by creating a series of real-life scenes that often occur, such as being reprimanded in the company and then going home to digest the emotions on their own, so that the player can bring himself into the character and generate emotional resonance with the character. And make use of game mechanics, such as the game mechanics of small frustration punishment mechanics. Hudlicka [14] states that "emotional play" means adapting to the player's emotions in order to minimize frustration while ensuring that the game is both challenging and enjoyable. To give the player spiritual value.

5.1. Data Collection

The original idea was to have about 30 participants, a sample of players, played the game and asked them to fill out a log for two weeks. Then the data was obtained by integrating their information (mood, evaluation, etc.) in the log, and then the effect of flow in emotionally oriented games was analyzed. However, since the game is still in the early stage of design, there is no way to achieve the experimental effect, so this experimental scheme cannot be implemented. So this study adopted a method that can be implemented at present, that is, questionnaire survey. Again, the same participants were asked to fill out questionnaires about the expected effects of the flow in the game after observing the video explaining the game design. Then, the data and information provided in the questionnaires of 30 sent out, 30 recycled, and 30 valid information were classified and analyzed.



Figure 1: The emotional introduction cover to the game

This game is designed to be a rogue like game (Figure 1), using the diversity and randomness of the rogue like game to express the complexity of emotions. Use the fun of this game to bring emotional value to players, and pass on how to actively balance emotions to players.

The questionnaire consists of 30 questions, and the survey is divided into five aspects: basic information (including 3 questions), previous game experience (including 2 questions), previous flow experience (including 7 questions), previous emotional experience in the game (including 3 questions), feedback on the game design (including 10 questions), and what kind of open-ended questions (including 5 questions) are expected from the emotional game. The advantage of asking questions in this way is to fully understand the player's three stages of the game: before, now, and in the future, so that it is convenient to intuitively feel the changes of the player. There are a total of 30 questions, and three question types are used to increase the interest of the respondents. 20 multiple-choice questions and 5 Yes or No questions to get valid data, and 5 open-ended questions to provide different perspectives and perspectives.

5.2. Data Analysis

The majority of players are between the ages of 18 and 24, with a higher percentage of male players (70%), which is probably in line with the mainstream audience in the gaming market (Figure 2). The game time distribution shows that the majority of players play 11-20 hours per week, indicating that the sample includes many active players.



Figure 2: Partial data charts

Flow experience: Data shows that most players experience flow often or sometimes during emotionally oriented games, especially in terms of total immersion in the game and balance of skill and challenge. However, a significant proportion of players experience little or no immediate feedback and loss of self-awareness, suggesting that more attention to these aspects of game design may be needed to enhance flow experiences.

Emotional experience: Emotional resonance and emotion-driven storytelling are common among players, but user interfaces and feedback are slightly less effective at enhancing emotional experiences, which may be an area for improvement in future game design.

Game design feedback: Players generally agree that character design and emotional decision points enhance immersion and interactivity, but when it comes to the integration of emotional elements into UI design, there is more neutral opinion, indicating that there is room for improvement. Culturally sensitive design received high recognition, indicating that global players responded positively to the game's multicultural expression.

Yes/No: Most players believe that game difficulty matches individual skill, character expressions and actions enhance emotional engagement, while the effect of social elements on emotional experience is divided, which may be related to the type of game and personal preferences of players.

To sum up, emotion-oriented games are effective in providing flow and emotional experiences, but there is still room for improvement. Game designers should focus on how to better integrate immediate feedback and user interface design to enhance the player's flow experience. At the same time, the emotional resonance and narrative of the game are more attractive to players and should be maintained and optimized. Social elements need to be designed to take into more careful consideration the needs and preferences of different players. Through these analyses, we can provide valuable feedback on game design to enhance the overall gaming experience for players.

5.3. Extended Discussion

Flow, as a deeply immersive experience, plays a central role in game design. It involves the balance between the player's skill and challenge, clear goal setting, the provision of immediate feedback, focused attention engagement, loss of self-awareness, and the perception of a sense of control over the activity. These elements work together to bring the player to a state of self-absorption in the game world, where time and self-awareness temporarily take a back seat and the activity itself becomes the focus. Players in this state not only experience fun and satisfaction, but are often accompanied by positive emotional responses such as excitement and a sense of accomplishment.

However, the realization of flow is not without challenges. In design practice, ensuring that all players can experience flow during the game requires careful adjustment and personalized design. For example, the skill levels and preferences of different players require that games provide dynamic difficulty adjustments and diverse challenges to maintain a balance between skill and challenge. In addition, clear goals and immediate feedback are critical to maintaining player flow, which requires game design to be responsive to player behavior and provide clear goals.

In emotionally oriented games, flow experiences are closely linked to emotional experiences. Emotional design not only enhances the player's sense of immersion, but also triggers strong emotional responses that deepen the flow experience. However, this design also needs to be handled carefully to avoid over-manipulating the player's emotions or causing discomfort. Game designers must strive for a flow experience while keeping the emotional well-being of players in mind, ensuring a safe and inclusive game environment.

Overall, the flow experience is one of the key factors in the success of emotionally oriented games, and it requires game design to take into account multiple dimensions, including technical application, emotional balance, individual differences, and ethical considerations. By understanding the

components of flow and the needs of players, game designers can create games that provide a deep flow experience while respecting the emotions of the player.

6. Conclusion

This study delves into the application of flow theory to emotion-driven games and assesses its impact on game design and user experience. According to flow theory, players transition to flow through a number of factors, including a sense of control, emotional depth, skill challenges, clear goals, and immediate feedback. A theoretical game, Tide of Emotional Chaos, uses emotional engagement and game mechanics to stimulate this state of flow. The initial design of the game was evaluated by collecting questionnaires about players' expectations for potential streaming experiences.

The findings show that players often experience flow in emotionally oriented games, especially when balancing skill challenges with total immersion. However, a significant number of players also reported a lack of immediate feedback and self-awareness, suggesting that game design must pay more attention to these key aspects. While players find emotional resonance and narrative-driven elements appealing, the effectiveness of the user interface and feedback mechanisms when it comes to enhancing the emotional experience falls somewhat short, suggesting that there is plenty of room for improvement in game design in the future.

Game designers are advised to prioritize the integration of immediate feedback and user interface design to enhance the player's streaming experience. In addition, the emotional narrative of the game, which is very appealing to the player, should be preserved and optimized. Although the study has limitations in terms of sample size and theoretical basis, its findings make a significant contribution to the field of game design and theoretical research. These insights not only highlight areas for improvement, but also serve as a compass for future research that may lead to a more nuanced and comprehensive understanding of flow in emotionally driven games.

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