Exploration in Open-World Videogames: Environment, Items, Locations, Quests, and Combat in The Witcher 3

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The purpose of this research is to examine how players engage in exploration in videogames. Open-world games are becoming increasingly popular, however, despite this growing popularity, empirical research into how players engage in these spaces is still emerging. By understanding how players will explore, designers can continue to create engaging open-world experiences. A diary study was conducted to examine participants' gameplay experiences while playing an open-world game. Twelve participants took part in the study by playing The Witcher 3 for two weeks. Through a thematic analysis of participants' diary entries, five activity themes were found – including exploring quests, items, combat, locations, and interactive environments. The results presented in this paper expands on the emerging research, and provides a deeper understanding of how players engage in exploration in videogames.

1 INTRODUCTION

Exploration can be defined as the act of searching or finding [30]. When inspired by curiosity, exploration can be linked with play and inquisitive pursuits as an individual makes sense of things that are different or novel [8]. In videogames, the act of exploration may be considered in terms of spatial exploration, including exploring a game world, looking for new locations, collecting items, and completing quests [31, 34, 37]. There is an increasing trend toward the design and development of large open-world videogames [25, 27]. The advantage of implementing open-world videogames compared to more linear experiences is that open worlds offer players more freedom [2]. Due to this freedom, how players engage in moment-to-moment gameplay within these open worlds becomes less predictable [2]. As such, it is relevant to examine how players may engage in these spaces in order to continue to create engaging open-world games.

We know that exploration in videogames is an important activity to players. Models for player behaviours often include an archetype for players motivated by exploration [4, 6, 19, 26, 33, 38]. For example, Bartle's [4] player types includes an Explorer-type for players who enjoy interacting with the game world. Explorers enjoy 'exploring' virtual worlds to "find out things about the virtual world and how it works" [5]. Exploration-related activities have also been the focus research in the context of player experience – such as immersion [23], presence [32], and curiosity [16]. While PX models demonstrate that players can be motivated by exploration-based play, much of the background literature on exploration in videogames has remained the speculation of designer blogs, textbooks, and dissertations; with academic research into exploration still emerging, but rarely as a core focus of studies (cf. [31, 34, 37]).

The purpose of this research is to examine how players engage in exploration-based play. This type of play is of particular interest to us because of its 'fuzzy', and emergent nature, and how it may be facilitated in open-world games. In order to investigate how players engage in moment-to-moment gameplay, a dairy study was undertaken to analyse player experience in The Witcher 3 (TW3) [11]. Twelve participants played TW3 three times per week for two weeks and completed a diary after each session. Each diary entry prompt asked participants to specify a primary activity that they engaged with during their

session. When examining the frequency of activities that emerged from diary entries, exploration was a common activity. This paper will specifically examine participants' experiences of exploration, and how participants described collecting interactive items from the game world (such as alchemy ingredients), searching for locations, exploration as a part of quests, and fighting monsters in the game world. Our findings, help us as develop a better understanding of exploration as an activity that can be partnered with different types of activities, and we identify that having multiple points-of-interest (such as enemies, locations, etc.) to capture players' attention may be key to creating engaging exploration experience.

2 BACKGROUND

Game mechanics are created by designers to facilitate gameplay [1, 13, 18, 22, 36]. Exploration in videogames is typically facilitated by open-world games, and is often related to navigating through the game world or creating narrative [9]. Open world videogames offer players with a non-linear, emergent gameplay experience [2].

While these open-world experiences may appear to the player less 'designed', developers design these world to strike balance between encouraging player-driven exploration, and directing the player [15]. When designing open-world games such as The Witcher 3, CD Projekt Red utilised a 40 second rule for how often players' attention should be captured in the game world, meaning that when moving about the game world, the player should see something interesting every 40 seconds [28]. Gómez-Maureira, Kniestedt, Van Duijn, Rieffe and Plaat [15] describes four level design patterns that exist within open-world games in order to inspire curiosity-based exploration and capture players' attention, including:

1. extreme or hard-to-reach locations (e.g. tall mountains);
2. solving environmental puzzles in order to uncover something (i.e. items);
3. elements or objects that are out-of-place in the game-world; and
4. developing an understanding of how areas relate to each other or spatial relationships.

According to Adams [1], gameplay is the actions that players can enact while overcoming challenges in pursuit of a goal [1]. Exploration without challenge becomes 'sightseeing' [1]. Adams [1] outlines four challenges commonly associated with exploration in games, including identifying spatial relationships, finding keys, finding hidden passages, and mazes and illogical spaces. These challenges are goal-directed giving the player motivation to explore to find items, and navigates through the complex game world (e.g. mazes), which shares similarities with the patterns described by Gómez-Maureira, Kniestedt, Van Duijn, Rieffe and Plaat [15].

Exploration has been identified in games research in relation to collecting items [3, 31, 34, 37], finding new locations/landmarks [31, 34, 37], exploring as a part of a quest [37], progressing through the game world [3, 34], and gaining a understanding of the game world through spatial exploration [31]. Some of these gameplay activities are clearly goal-directed, while others may be player directed, depending on how the game encourages the player to pursue the activity. This research will explore how players describe engaging in exploration in open-world games and contribute to the growing body of knowledge of exploration in videogames.

3 RESEARCH DESIGN

While the focus of this paper is on exploration, it forms a part of a larger research project which examines videogame activities more generally. An online diary study was designed in order to gather in-depth information about participants' experiences in specific contexts. The study was designed around experience sampling [21] and diary studies [10, 14] to gather participants' experiences of activities in-situ rather than retrospectively. This method was chosen in order to capture participants' experiences in a more natural setting, as opposed to a lab study.

The study was comprised of two key phases, (1) an orientation where participants were trained how to complete the diary and asked to complete a brief demographic survey; and (2) a diary study which was to be completed after each videogame play session for two weeks (a minimum of three times per week). During the two-week diary study, participants were asked to play one-of-three videogames, including StarCraft 2 (SC2), The Witcher 3 (TW3), and Star Wars Battle Front (SW:BF). Each of these

games were chosen to allow us to focus on specific types of activities for example, SW:BF allowed us to examine how players engage with player-verses-player conflict, while SC2 players were expected to engage more with economic play. The focus of this paper will be on the experiences of participants who played TW3 which was specifically chosen to examine exploration activities.

3.1 Participants

Twelve participants played TW3 as a part of the dairy study. Of these twelve participants, seven identified as male and five identified as female; participants typically belonged to the 21-29 years old range (18-20 n=1; 21-29 n=8, 30-39 n=3). Five participants had never played TW3 before participating in this study (participants 4, 21, 23, 24, 29), while seven had played the game before (participants 3, 22, 25, 26, 27, 28, 30). Participant 28 had even described TW3 as their favourite game during the demographic survey.

Participants were recruited primarily via social media; including across a number of Facebook special interest groups, including Queensland University of Technology (QUT) Gamers Society, QUT IT Club, and GGC (a page for 'geek' girls). Permission to advertise the study was granted from page owners and administrators. From there, the sample snowballed as participants invited their friends to participate.

3.2 Procedure

The orientation session was held face-to-face or via video chat as an initial interview that took approximately 20-30 minutes. These sessions were designed to demonstrate to participants what they would be doing throughout the study and instruct them how and when to complete each diary entry. The online demographics survey was also administered during this initial briefing. Participants were given 10-15 minutes to complete the survey.

During the diary portion of the study, participants were asked to play their chosen game three times per week for two weeks. After each session they were asked complete a diary entry (minimum of three entries per week). The diary asked participants to select one primary activity for each play session. These activities were derived from Adams [1] overall categories (i.e. conflict, exploration, conceptual reasoning) and included the two new narrative categories [35]. Participants were then asked to describe this main activity they engaged in, using the examples from the game. This question allowed us to examine the context in which participants' activity experiences occurred. The results of this section of the study will be the primary focus of this paper.

The final section of the diary asked participants to select a 'secondary activity' that they believed they engaged in during their session – this activity is essentially a support activity for the primary activity. For example, players may be exploring the environment and engaged in combat while they explore; therefore, the participant would select Exploration as a primary activity, and Conflict as a secondary activity. After selecting their secondary activity, participants were asked to comment briefly on their perceived experience of flow in relation to this activity. However, this question was not compulsory to the logic of the online form, so participants could skip the question if they were unsure.

4 RESULTS

4.1 Diary Entry Activities

Figure 1 provides an overview of the activities chosen by participants during the diary portion of the study while playing The Witcher 3 (TW3). Exploration-based activities were the most common activities with twenty-six primary instances and eighteen secondary instances; and was described in at least one diary entry by all 12 participants.
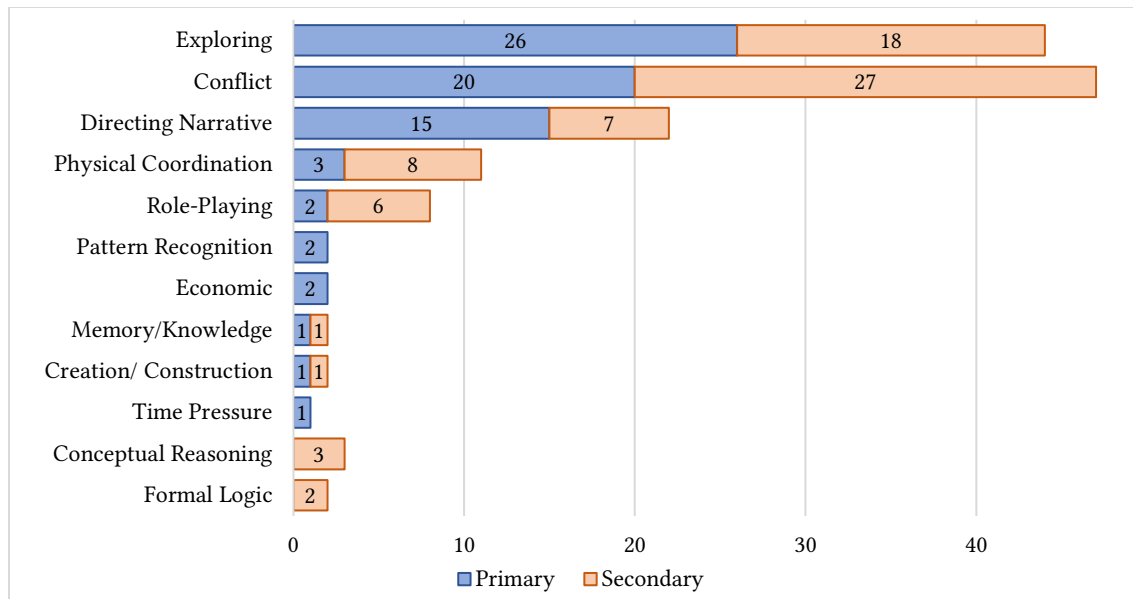
Figure 1: The frequency of activities chosen as primary and secondary activities during the diary study.

Figure 2 demonstrates the connection between the primary activities chosen by participants in connection with the secondary activities chosen. When Exploration was chosen as a primary activity, conflict was typically chosen as the secondary activity. Participants who chose Exploration also chose Physical Coordination, Directing Narrative, Role-Playing, and Conceptual reasoning. Exploration was chosen as a secondary activity by participants who chose conflict as their primary activity, though some participants who described Directing Narrative, Physical Coordination, and Role-Playing as their primary activity also described Exploring as their secondary activity.
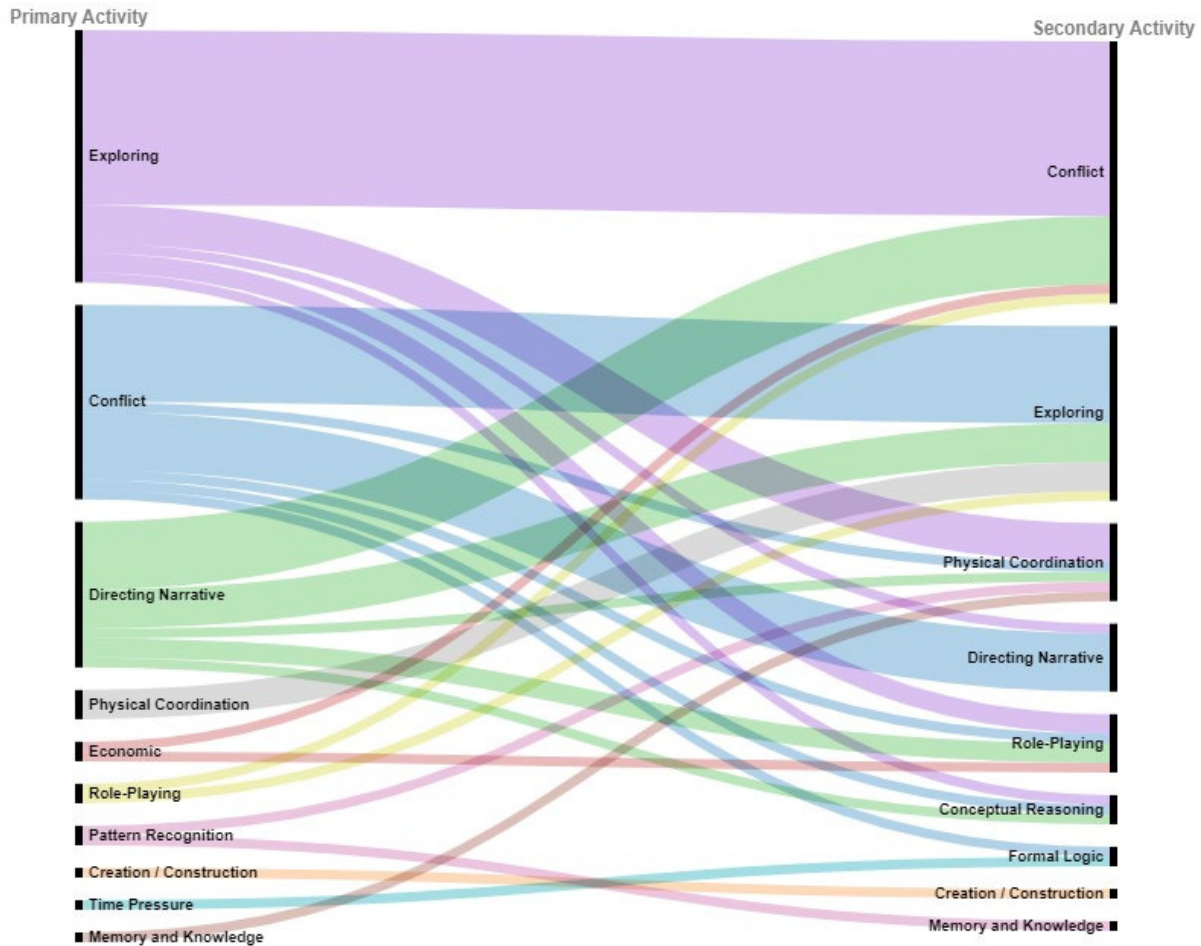
Figure 2: An eluvial diagram representing the connection between the primarily activities in relation to the secondary activities chosen by participants.

4.2 Exploration in The Witcher 3

To develop a deeper understanding of how players engaged in exploration, we conducted a thematic data analysis on participants' descriptions of their exploration activity. The thematic data analysis was conducted in six phases [20]. The first phase (1) including reading participant entries to familarise ourselves with the data; (2) followed by an initial coding phase, where codes were allowed to emerge from the data, rather than being pre-determined based on theory (cf. [17]). When coding the activity contexts, two key questions assisted in the formation of activity codes: (phase 1) What is the participant doing? and (phase 2) How is it related to the activity category? Some participants provided rich responses that covered multiple themes, for example Participant 21 described "Travelling from place to place to talk to NPC's, complete quests, gather herbs, kill monsters..." which covers multiple themes. The resulting codes where then grouped into themes (phase 3), these themes were then reviewed for accuracy, and consistency (phase 4); then named (phase 5) for clarity and understanding of each of the themes. Five themes were identified when examining participant responses, these themes are reported in Table 1 (phase 6). While Exploring was described only 26 times as a primary activity by participants, some entries included multiple themes.

Table 1: Themes that identified during the analysis of participants' experiences of Exploration in TW3.

Theme	Description
Interactive Environments	Gathering alchemy and crafting materials from the interactive environment, these items often occur 'naturally' within the game world such as cuttings from plants, and products from animals.
Items	Similar to Interactive environments, where the player explores the game world looking for items or loot, this includes looking for special items.
Questing	Exploring the game world as a part of a quest or searching for a quest, particularly narrative related exploration.
Combat	Searching the map looking for enemies to kill, killing enemies which are guarding locations/items, or finding enemies to kill as a part of a quest.
Locations	Exploring the game world looking for new locations or just to explore the world

During the thematic analysis, diary entries were also categorised based on whether participants' descriptions could be identified as 'goal directed' or 'open exploration'. In entries that were considered 'goal directed', participants typically described a clear objective such as 'finding items' or 'finding an NPC'. While 'open exploration' entries were less goal directed, the participants typically described wondering around and stumbling upon things to do. Sixteen entries described more goal-directed exploration activities, while ten participants described open exploration.

4.2.1 Interactive Environments

The interactive environments theme was identified based on the experiences of participants who travelled through the TW3 game world looking for alchemy or crafting ingredients. These experiences were considered to be a unique theme from typical item seeking activities because these are embedded within the game world. Interactive environments typically included gathering items from the game environment such as plants or animal materials, as opposed to collecting weapons and armour. It was a relatively tight theme, with only three diary entries describing engaging with the interactive environment (see Figure 3). These ingredients allow players to craft new potions and oils and build new armour or weapons to make Geralt more effective in battle, such as in the experience of Participant 27 who described *"finding herbs and objects to help craft and make me stronger in ability points and also craft better oils and potions and elixirs."*

Figure 3: (1) Plants in the game world allow players to interact, (2) these ingredients can be collected and used for crafting.

4.2.2 Items

The items theme was decided as being unique to the interactive environment theme due to these items being special in the game world, and not necessarily integrated into the environment in the same way as alchemy or crafting materials. This theme was described in nine diary entries. Often these items include general loot (see Figure 4), glyphs, runestones, weapons, armour, and items for a quest. Participant 22 describes finding items that are hidden around the world: *"… looking for any useful items, then rinse and repeat."*

Witcher School Gear is stronger than typical gear in the game and has a unique cosmetic look. Collecting these items is often a little more challenging than standard gear and is described as completing puzzles and quests. Participant 25 describes searching for Witcher School Gear, which were hidden throughout the world: *"I was hunting around trying to find pieces of the Wolf school Witcher gear. This involved finding hidden items like stones to plug into a portal."*

Figure 4: The player can find loot and items in the world to collect.

4.2.3   Quests

Twelve diary entries reported engaging in exploration as a part of a quest; while some participants, such as Participant 24, described moving through the game world looking for quests to complete. TW3's design includes a player character ability called 'Witcher sense' which allows the player to locate interactable objects or clues in the environment (see Figure 5 – image 1). Using the Witcher sense, Participant 4 described searching the environment for clues: *"Looking for clues as to why certain people were killed our (SIC) how they disappeared"*.

Participant 25 recounted their experience of searching around for quests which are scattered throughout the world: *"Really just exploring the countryside, looking for loot and side quests to perform. I roamed around the area of white orchard and looked for things to explore…"* Other participants described searching the world for items, people (see Figure 5 – image 2), or monsters to satisfy quest conditions.

Figure 5: (1) The player uses 'Witcher senses' to see quest objects in the environment, (2) the player can find quests by talking to NPCs.

4.2.4 Combat

Combat was identified in eleven diary entries. Typically, participants who reported exploration in terms of combat would describe finding enemies in the game world that they would have to defeat in order to keep exploring, or would be specifically looking for enemies to fight (for example see Figure 6). The motivation for specifically looking for enemies is varied depending on the entry, some participants were looking to gain experience, hoping for a monster to 'drop' specific item upon its' death, or looking for enemies as a part of a quest. Participant 29 described fighting as a part of a quest: *"Fetch quests. 'A ghost is haunting our well, go kill it'. It's pretty easy, follow the markers on minimap (SIC). I have all the tutorials on, told me I should make some potions to kill wraith…"*

The theme of combat was often described along with items. In TW3, items and gear are hidden behind enemies that the player must defeat in order to collect. Participant 22 describes fighting monsters to access items: *"Often finding a hidden area or point of interest meant having to fight through several enemies before it was safe to grab loot."*
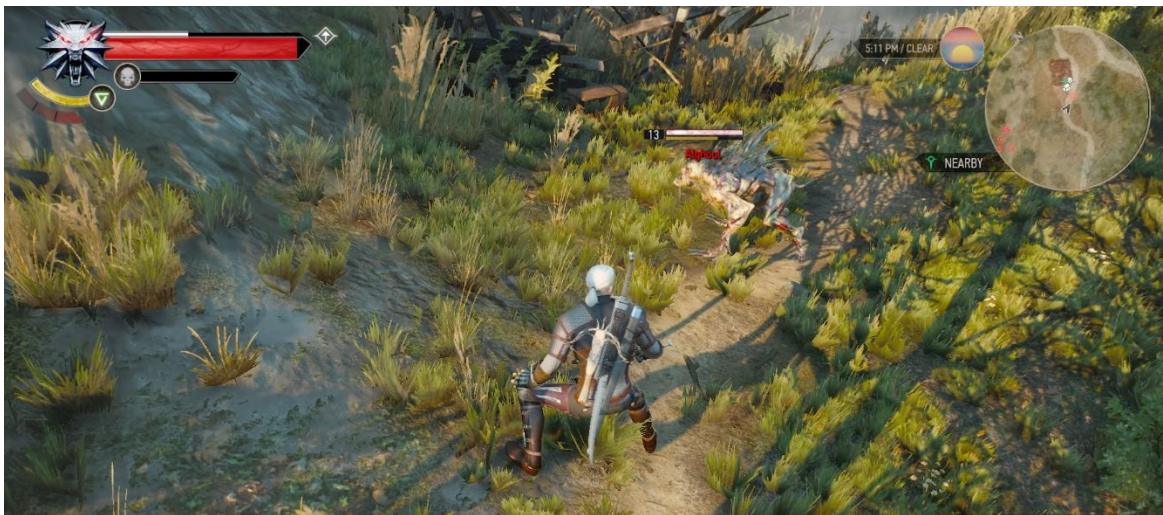

Figure 6: Enemies can be found throughout the game world for the player to fight, in the image above, the monster protects hidden treasure.

4.2.5 Locations

Finding locations was also a key theme that emerged from fourteen diary entries. Some participants described specifically looking for new locations on the map (see Figure 7), while others described simply exploring and finding new locations along the way.

Participant 29 described searching new locations and uncovering the 'question marks' on the map: *"Finding bandit camps, finding places of power, finding all the question marks on the map."*

TW3 has six world maps with hundreds of locations for player to find and explore, see Figure 7. Some of these locations include towns, monster dens, places of power, or other points of interest which may contain quests, interesting monsters, or loot [11]. Having these new points-of-interest encourages players to explore these new areas. *"Most of the time I was riding around looking for new and interesting things. I only got to the new area at the end of my last session, so it was all about going around and trying to find things* (quote by Participant 24).*"*

Figure 7: An example of the map from TW3 as described by Participant 24. The world map includes point of interest such as towns, monster nests and quests for the player to uncover. The '?' denotes locations that the player is yet to uncover.

5 DISCUSSION

The aim of this research was to examine the how players engage in gameplay, specifically exploration activities. Exploration-based activities were the most common primary and secondary activity chosen by participants who played TW3 during this study. The prevalence of exploration makes sense given that TW3 was specifically chosen due to its rich narrative and open world, however it indicates that when given the chance to explore an open world the players will take the opportunity.

Five themes were developed based on participants' descriptions of their exploration activities while playing TW3. Four of these themes are evident in existing literature, including interactive environments, finding locations and items, and exploring during quests. Exploring new areas, completing quests and finding things were identified by Wood et al. [37] as behaviours that makes games enjoyable, these themes were also reflected in the results of the dairy study, where participants described exploring to find new locations, items and quests. Vahlo et al. [34] found that experimenting in a game's world was a key element of a game reviews – we may conceptually link this to theme of engaging with the interactive game world in TW3 where players collect alchemy ingredients or simply moving through the game world 'aimlessly'. Searching for specific items and locations was also discovered by Si et al. [31]. The fifth theme from the diary study, centres on engaging in combat, which is less evident in exploration literature and will be discussed in Section 5.3.

5.1 Exploration is often combined with other activities

TW3 is designed to allow players to engage in multiple activities at once. In our examination of the activities chosen by participants and their descriptions of these activities, exploration was often combined with other gameplay activities. Which is unique compared to the research described in the literature. Of the key themes that were identified from participants' diary

entries – collecting items, engaging in quests, and combat are activities and challenges that belong to their own categories – respectively, economics, directing narrative, and conflict.

The shorter duration of activities such as conflict and economics may explain their overlap with exploration, as players are able to engage in these short-lived activities as a part of their exploration. While exploration activities may be considerably longer or persistent. This overlap was also evident in participants' descriptions, such as participant 22:

> *"My main aim was to find useful items at the undiscovered locations marked on the map, however I did stumble across a few areas that weren't marked on the map at all. Typically I was just riding the horse from map marker to map marker, clearing the area of any enemies that might have been present, then looking for any useful items, then rinse and repeat."*

In this entry, Participant 22 describes exploring while looking for locations, combat, and items. This indicates that exploration is an activity that can span a considerable duration, but also lead to short-lived activities. Exploration may also be paused when a player reaches a point of interest, or exploration may be the activity the players engage in while on the way to other objectives. This demonstrates that when exploring players would often be considering other objectives. This might suggest that the participants' goal (or objective) while engaged in activities may shape their perspective of this activity. Where one participant might choose conflict as their category for that experience, another might choose exploration. This may relate back to player preference. Ultimately, by including shorter-lived activities within much more expansive exploration activities may help facilitate engagement.

5.2 Open and Goal Directing Exploration

Giving players something to draw their attention was key outcome of this study. According to Adams [1] giving players' a goal to help direct their exploration in important for exploration based play. When examining participants' diary entries, a majority of entries described more goal-directed exploration such as exploring to find items, quests, or enemies. Such as Participant 27, *"I was exploring the land for certain shrines/artifacts that would give me an ability point to help increase my skills."* In their experience, exploration was the process in order to achieve their goal of locating a point-of-interest in the game world.

While Participant 21 and 25 described more open experiences, which were less goal-orientated: *"I stumbled across a griffin, and found a body with a note explaining he had discovered a house with a chest filled with gold in the cellar. I found the cellar but couldn't find a key"* (quote from Participant 25). In the experiences of these participants, exploration was the activity they were engaging in, but became involved in other tasks. The richness of the tasks and objects that can capture the player's attention while exploring is once again evidence the developer's 40 second rule approach to open world development.

Participant 24 described an even less goal-directed experience, where they were less driven by objectives given by the game (such as 'find this NPC'), but was driven by their personal objective to explore, they wanted to find new locations and would wander through the game world. While the game world helps facilitate exploration through its populated environmental, how players engaged with this world may be dependent on the motivations of the player. Players can spend quite a bit of time moving through the world uncovering every location on the map marked with a '?' (such as Participant 24), or players can also move directly from one location almost directly to the next with minimal exploration. How players engage with the map may be defined by their individual play styles or preference. However, players of different styles may also engage in exploration as not all players fit a particular type [33].

5.3 Combat as a unique theme

When examining the relationship between primary and secondary activities in Figure 2, we can see a strong connection between participants who chose exploring and conflict as their primary and secondary activities. Related to Conflict, combat emerged as a theme during the thematic analysis of participants' diary entries. From the literature, we know that conflict and combat are central elements to the player experience [4, 6, 7, 24], however the concept of explicitly engaging in combat as a part of exploration is novel and yet to be captured by existing literature. Based on our study of TW3, we identify that the game is designed in a way that allows combat contribute to exploration in terms of narrative and worldbuilding, as well as guiding player through the game world.

When we consider the design of open worlds, and how developers aim to make these world feel as real and populated as possible (cf. [12, 29]) it makes sense that engaging in conflict and combat would be a feature in these open world games. In TW3, monsters and enemies contribute to a sense of worldbuilding, as the player plays as the character 'Geralt' who is a bounty hunter. Geralt's primary occupation is to travel the world killing fantastic beasts and other contracted targets, as such, providing enemies for the player to fight within the game world is likely to reinforces the game's world and story.

Additionally, enemies and combat are also used to guide players through the game world and give them a goal to achieve. Combat situations may act as an alluring point of interest that satisfies CD Projekt Red's 40 second rule for capturing players' attention [28] and guide them from point to point on the map. Which was the experience of Participant 22 who described moving through the world to clear out enemies. However, difficult combat scenarios may also help direct the player.

While some games provide players with game areas that are levelled appropriately for the player, TW3 uses a more open map style, where the player can move anywhere within the boundaries of the map. Enemies which are at a significantly higher levels than the player can help guide their exploration of the map to a more level appropriate location or encourage them to progress the story in order to increase their level. Participant 29 and 25 both described looking for appropriately levelled activities or leveling up so that they could progress and engaging in difficult combat situations as they explored the game world. In these cases, the game uses difficult enemies as a way to keep the player engaged in the game's narrative and keeping to the relevant areas without putting up obvious barriers.

5.4 Limitations

This research was limited by the number of participants who took part in the diary study, future studies would need to explore the experience of a larger number of participants. In addition, this research focused on a limited number of games with a limited number of explorative level design patterns, future research might explore how a wider variety of games might illicit more exploration-based activities. In particular, TW3 is a game designed with a large open world and is combat heavy, future research might focus on games with less combat to explore how players behave.

6 CONCLUSION

The finding of our research contributes to our understanding of how players engaged in exploration-based play in open-world videogames. In this study, exploration-based activities were the most popular activity for participants who played TW3. While playing TW3 for two weeks participants playing described exploring for quests, items, combat, locations, and interactive environments as key themes that emerged when examining how players interacted with exploration-based play. Exploring in relation to combat was a unique theme compared to the literature. Based on these finding we suggest that giving player's points-of-interest, or short-lived activities within expansive world may assist in player engagement. In the context of TW3, conflict and combat activities are particularly relevant to help give life to the story and to the game world. The complexity of these activities may be attributed to the dynamic design of TW3. Future research might examine how participants describe conflict-centered activities in relation to exploration and examine the role that narrative plays in exploration.

Acknowledgements

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