

# Building Worlds Together

## Understanding Collaborative Co-Creation of Game Worlds

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### ABSTRACT

This paper presents a preliminary exploration of games as sites of collaborative game world creation. By this, we mean the processes in games by which players take on a dual role as player within the game world and maker of the game world, sharing authorship of the world and its design with the game’s designers and other players. We explore several examples of games featuring game world co-creation at the core of their gameplay, and use this to create a model for understanding the commonalities across these various games and how they facilitate this collaborative process. By examining similar structures in the design and play of these games, we can better understand how to identify this process in existing games and how to better create games that allow for this in the future.

### CCS CONCEPTS

• **Software and its engineering** → **Interactive games.**

### KEYWORDS

co-creativity, worldbuilding, cooperative storytelling

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## 1 INTRODUCTION

In this paper, we are interested in examining the role of the player as not just experiencing a game world designed for them, but being a part of actively creating and shaping the world for themselves and others. This creative, collaborative process allows players to take on new roles not just as players but as designers and content creators, co-authoring the game world alongside the game’s makers and other players. We refer to games that allow for this process of making the game world through play as games that facilitate game world co-creation.

This paper works to identify the key elements of such games, and how both their design and mechanics allow players to take on the shared role of players in the game world and as makers

of that game world. It begins by discussing prior work, including how the idea of building co-creative game worlds situates itself relative to other works on co-authorship in games. It then provides a preliminary exploration of some such games that facilitate this game world co-creation. We first examine examples of early games that feature such co-creative processes, examining the mechanics of Dungeons & Dragons and LambdaMOO as examples of a tabletop RPG (TTRPGs) and a Multi-User Dungeon (MUDs) that feature this kind of gameplay. We use this to build a preliminary model, identifying the particular shared structures that allow for game world co-creation in these games. We then examine two other games—Minecraft and *Microscope*—that we believe to have similar elements of game world co-creation, and discuss how the features of our model could be applied to them.

## 2 PRIOR WORK

Previous discussions of narrative and meaning-making in games have focused on similar ideas to the proposed discussion of game world co-creation. For instance, game systems such as *Façade* situate themselves at the “middle ground between structured narrative and simulation,” drawing on the strengths of both authorship and emergence in order to allow the player both freedom and structure in interacting with the game’s narrative [8]. The idea of game world co-creation proposed here fits in this “middle ground” nicely. In our proposed framework, game designers are able to create an initial given world for players, including constraints on how the players can manipulate said world. Throughout the course of play, players interact with one another and with the world to collaboratively change the world over time. This process allows them to access some authored content, but also allows them to experience and create new paths and stories brought about by altering the game world over time.

Other previous game studies research discusses the role of player interaction in creating stories through play. Ben Samuel discusses the idea of play as “shared authorship,” in which the player collaborates with the game system in order to create a new “narrative artifact” [17]. While the idea of game world co-creation offers a similar relationship between the game designer and player, allowing the player to become a co-author of the game narrative through play, our idea refers specifically to games in which the player co-creates through the manipulation of the game world, creating a shared and persistent world in the process. Another model proposed by Max Kreminski discusses “gardening games” as a framework for understanding games that generate content based on the requests of the player [7]. While this concept is similar to our the proposed concept, the role of the player in gardening games is generally more passive, with more restrictions on how players can act in the game world.

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### 3 A PRELIMINARY EXPLORATION OF CO-CREATIVE GAMES

In order to further refine what we mean when we talk about games that emphasize the co-creation of game worlds, we present several examples of such games. We use these examples as a preliminary examination of these co-creative processes, with the hopes that such an examination will help us to understand what features are common across these games. By understanding these common features, we can begin to build a model for understanding game world co-creation in general.

#### 3.1 Dungeons & Dragons

Dungeons & Dragons (D&D) is a tabletop roleplaying game in which most players take on the role of individual members of an adventuring party. One player serves as Dungeon Master (DM), describing the world for players and presenting them with opportunities and obstacles within it. Although the game has existed featuring many different rulesets and editions, this paper discusses the game in broader terms, referring to the general experience of roleplaying in this game. Previous research on D&D has examined in some respects the role of player as co-author within the game, such as describing frameworks positioning D&D as blurring the line between the author and reader in comparison to other interactive narrative systems [1] and descriptions of D&D as a co-authored work of collaborative fiction created by the DM and players as both “co-authors and audience” [13]. Other research discusses the systems by which D&D facilitates collaborative storytelling, such as discussing how paradata and framings within D&D’s rulebook allow players to create a shared story, [6] and the role of power and hierarchy in D&D’s co-authorship [5]. While these approaches are useful in identifying D&D as a co-created narrative, this leaves out the role of world co-creation in collaborative worldbuilding. The *Dungeon Master’s Handbook*, 5th Edition—a guide for helping DMs understand how to run a D&D game—puts the game world front and center, beginning with the first part, “Master of Worlds,” which details how the DM builds a world for players to explore [21] and how to run a collaborative game within that world. By examining how the rules and structures of the game follow the structures for co-creation as outlined in the model presented above, we can understand how D&D facilitates co-creative worldbuilding as central to play.

*3.1.1 Player-Determined Game World.* In *Dungeons & Dragons*, game world co-creation operates differently for the DM and the players. A majority of the details of the world are determined by the DM, both formulated before the start of play and as improvised during play. The DM determines the core features of the world, some examples of which are given in the *Dungeon Master’s Guide* as the world’s religions, magical properties, level of danger, and history [21]. This can also involve creating different regions of the game world and determining organizations, hierarchies, and races of that world. While these broad elements of worldbuilding are usually determined in advance, with the DM providing them to the players at the start of play, the DM is also responsible for worldbuilding in response to the players’ actions in the world. As described in the *Player’s Handbook*, 5th Edition, when players choose to act in the

world the DM describes back to them the results of their actions, often based on the difficulty of the task, the player character’s skill at performing that task, and the results of a die roll [10].

The players who roleplay characters within the game world take on the task of exploring the game world, performing social interactions and combat within it [10]. The players first decide on the details of their character, and then play the role of that character, choosing what they want to do within the game world. Through their actions, they also shape the game world. The players request more details about things they find interesting or suspicious within the world, and can choose to seek out particular places, quests, or things to do that are in line with what their character would want. The particular backstory or character goals may also determine part of the world’s history, or influence events to come. Because the creation of the game world happens during play, both players and the GM operate as both creators of and players within the game world.

*3.1.2 Adaptable Game World.* The gameplay of *Dungeons & Dragons*, according to the *Player’s Handbook*, largely takes place “in the imagination of the players and the DM” [10]—otherwise known as the “theater of the mind” [18]. While the rulebooks provide a basic outline for the creation of and rules within the world, these merely serve as guidelines [21] to facilitate the collaborative worldbuilding process. Because the game world primarily exists as a shared artifact in the imagination of the game’s players, this allows the world to be highly flexible. The DM may add new adventures, characters, and encounters for the player easily by describing them, and players have a high degree of agency, able to attempt any action they want within the game world. Thus, the game world in D&D is highly extensible, able to be expanded upon through the DM and players continuing to share parts of the co-created story.

*3.1.3 Moderated Game World.* Within *Dungeons & Dragons*, game moderation comes in the form of the Dungeon Master. The DM is the arbiter of the game world, and has the final say in determining both what exists in the game world and the results of players’ actions within it. This moderation serves several different purposes in play. For one, this allows the DM to play the role of “referee,” helping to enforce the rules of the world and make sure that all actions that happen within it make sense according to the player’s abilities within the game world. In another respect, this moderation gives the DM more power in the game to customize the game world to fit the wants and needs of the players. This moderation is key to the shared construction of the game world by creating more consistency of the shared world through enforcing rules, while also allowing for a customized, cohesive world that centers around the players.

#### 3.2 Multi-User Dungeons

Multi-User Dungeons (MUDs) are virtual, networked, text-based environments in which players can interact with one another and with the world through typing commands into a console. Although there are many variants of MUDs and many different acronyms to account for their different technical and social functions [15], this paper uses MUD as a catch-all term to refer to these many types of communities, like roleplay-oriented MUSHes (Multi-User Shared

Hallucinations) or MOOs (MUDs, Object Oriented). In existing research on MUDs, researchers often discuss the role of the individual playing within the MUD, discussing how roleplay and discussion in these social spheres help individuals to construct an identity and sense of self [19], or how MUDs help to create social bonds with others [20]. But there has been little focus on the role of the player as maker in the MUD, particularly in regards to world co-creation.

**3.2.1 Player-Determined Game World.** At the initial creation of a MUD, the MUD's founder is the sole designer of the game world. As new people connect to the MUD, though, they are given the ability to modify the game world. By typing in specific commands, players are able to add items, rooms, and other features to the game world that can then be seen and utilized by other players [4]. **Figure 1** shows what a typical room and objects created by one player will look like to other players in that location.

```
The Living Room
It is very bright, open, and airy here, with large plate-glass windows looking
southward over the pool to the gardens beyond. On the north wall, there is a
rough stonework fireplace. The east and west walls are almost completely
covered with large, well-stocked bookcases. An exit in the northwest corner
leads to the kitchen and, in a more northerly direction, to the entrance
hall. The door into the coat closet is at the north end of the east wall,
and at the south end is a sliding glass door leading out onto a wooden deck.
There are two sets of couches, one clustered around the fireplace and one
with a view out the windows.
You see Welcome Poster, a fireplace, the living room couch, Statue, Helpful
Person Finder, lag meter, The Birthday Machine, a map of LambdaHouse, and
Cockatoo here.
Slej, Rusty (distracted), and Perry (out on his feet) are here.
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**Figure 1: A description of a room, items, and players in LambdaMOO**

This manual from LambdaMOO, one of the longest-running MUDs, details how one can add a new locations to the game world:

The basic tool for making a room is @dig. -Example of room creation: 'dig RoomName' When you create a room you'll see a message telling you the object number of your new room. You can go to this room by typing 'go #Room'sObjectNumberHere'. Once you're in your room, you can make it your home on the MOO by typing 'sethome'. [2]

There are also style guidelines denoted in the manual, encouraging players to adhere to the thematic and physical restrictions of the game world:

LambdaMOO takes place inside and on the grounds of a large, sprawling mansion... To add to the LambdaMOO universe, please look for themes that fit well into this framework. You can build your additions in limbo, disconnected from the rest, until you've got it up to a certain level of coherence.

Please note that we intend that the topology of the LambdaMOO universe be consistent: rooms should not overlap each other, going east through a door should be reversable by going west, etc. Please keep this in mind while building new areas. [2]

Game world modification is an important part of play within MUDs. It is through the collaboration of many individuals that MUDs can feature large, detailed worlds that serve both as a space for play and a center for the MUD's community. This customizability of the game world lets players determine what they want

to see in the world, such as creating a personalized home for their character. They can also use these commands to create content for others, such as making new routes and treasures to be found by other players in the game world.

Pavel Curtis, the creator of LambdaMOO, discusses several instances of this taking place in the game. One example was a player implementing a minigame within the game world of LambdaMOO allowing players to have food fights with one another [3]. Another instance of this is players creating a space for a virtual wedding on the server, set at a specific time and location for the MUD community to participate in [3]. The extensibility of the game world allows for spaces and encounters that serve as an amalgam of all those visiting and contributing to the MUD, rather than an single-authored story that players participate in, as would be the case in a typical text-adventure.

**3.2.2 Adaptable Game World.** MUDs are made to be highly extensible to allow players to expand upon the existing locations and items within the game world. The structure of MUDs makes this particularly feasible, often featuring an object-oriented code structure that allows new objects and rooms to be easily added to the game world through the use of commands typed into the parser. This works by placing all of the data on the MUD into a database that is being continually accessed by players. When players type in specific commands to alter the game world, this in turn modifies the database, either adding a new record or modifying an existing one [4]. This makes it easy for players to add new elements to the world that can easily be accessed by other players. Because the MUD world is text-based, players can largely add to the world anything they can imagine, supplying a textual description of the room or item and putting rules in place for how it interacts with the rest of the game world.

**3.2.3 Moderated Game World.** An important element of MUDs as co-creative games is the system of moderation with which players are able to control the content of the game world. Through game moderation, players can maintain the consistency and integrity of the game world while still allowing for a large degree of creative freedom from all players. In the case of Multi-User Dungeons, this hierarchy is a social hierarchy, with the most active members of the community (as well as the MUD's founders) given the most power to alter the game world [4]. These players, often called "wizards," [3] take on the role of community moderator and can change the world through the use of typed commands, as with standard players, as well as by removing individuals from the server, thus controlling who may add content to the world. This leads to a new focus of players "revolv[ing] around authorship and management rather than combat and play" [12], emphasizing the important role of player as co-creator.

## 4 A PRELIMINARY MODEL FOR CO-CREATIVE GAMES

After describing some examples of games that feature game world co-creation, we can look at features that are common across the games we have presented so far to see how they allow players to become part of the creation of the game world through the process of play. These features are the following:

- Players make decisions to inform what does and does not exist in the shared game world
- The game world can be extended and adapted to fit the desires of players (makers) in this space
- A system of moderation in place within the community controls what and how content is added to the world

These features allow the players to determine together what they want to exist within the game world, and then use the tools provided for them during play to extend the game world to fit what they would like to see within it. A system of moderation allows players to facilitate the content added to the game world in order to provide more control for players, allowing them to collaboratively shape the game world to fit their needs and desires. Although these may not be an exhaustive list of the features of such games, we can use this to examine other games to better understand how they facilitate gameworld co-creation.

## 5 EXAMINING OTHER CO-CREATIVE GAMES

### 5.1 Minecraft

Minecraft is a multiplayer sandbox game in which players can add to the game world through breaking and placing blocks, and crafting new tools and components using the base materials found throughout the world. Minecraft has been explored by researchers as a tool for collaborative play, particularly in relation to other forms of “construction-play” such as building blocks [9]. This particularly pertains to Minecraft as a tool for education and facilitating collaboration [11]. We can use these evaluations of Minecraft as a collaborative building tool, as well as looking at Minecraft’s core gameplay, to see how the game helps to facilitate co-creative worldbuilding.

*5.1.1 Player-Determined Game World.* In Minecraft, players control avatars in the game world, and can shape the game world through destroying and placing blocks to create new structures and explore various areas in the game world. Players can collect blocks and items within the game, and use these to craft new items which can then be further crafted or placed within the game world. Through this simple system of item collection and crafting, players can work together to build new items and structures, making changes to the game world that can be seen and used by others. While the initial game world is generated, players can quickly use the raw materials of the world to create more customized items and locations within it, including creating a home area with the resources and shelter they need to survive, or more decorative content to suit the player’s desires. The core gameplay for Minecraft features this process of construction and destruction of the game world as central to gameplay.

*5.1.2 Adaptable Game World.* Because destroying, collecting, and placing blocks is at the core of Minecraft’s gameplay, these are actions that are easy to perform by all players. The world is largely made of blocks that are positioned on top of and adjacent to one another, so the process of creating and destroying blocks allows users to quite literally shape the world, and the game world is highly responsive to the actions of players. Unlike the other forms of game world co-creation discussed in this paper, Minecraft features a graphically rendered world that exists as a shared physical space

between all players. It is due to the nature of the game world as based around the placement of individual blocks that Minecraft facilitates the co-creation of the game world by players.

*5.1.3 Moderated Game World.* Minecraft’s system of moderation employs a similar hierarchy to that of MUDs—with owners, admins, and moderators serving in a role as authority figures on the server, with the jobs of maintaining the server (and thus the game world) and moderating those who are a part of the community. While they are able to interact with the game world in the standard fashion detailed above, they are also given more power in manipulating the game world than regular players. They are able to make changes such as adding various plugins to the server itself, and are given an increased number of commands they can use to alter the game world (such as teleporting or giving items to players). They also have control over who can manipulate the game world by banning players from the server, thus curating both the content of the server and its creators. Those appointed to these roles are often those part of the server’s creation, or longstanding active community members on the server. Through this process of moderation, the community is able to decide on the content that is created in the world, and shape the game world collaboratively to fit what those on the server want to see.

### 5.2 Microscope

*Microscope* is a collaborative social worldbuilding game in which players each participate in creating the shared story of a universe, jumping between different scenes, events, and eras of that universe. *Microscope* offers a slightly different structure to its design as a co-creative game from the examples mentioned above, separating out the process of building the world from the elements of traditional roleplay. There has been very little research or discussion of *Microscope* beyond discussion of its role as a form of collaborative storytelling [14]. Here we discuss how *Microscope* fits within our model of understanding games with the co-creation of game worlds.

*5.2.1 Player-Determined Game World.* In playing *Microscope*, players build up the shared game world through roleplay and collaborative storytelling. Players take turns adding to the shared timeline of scenes, and events, and eras that have occurred within the game world, describing to other players what happens in their authored moment and how this fits in with the existing timeline. Players also choose a specific focus for storytelling in each round, a subject such as a person or event they want to explore in more depth, helping to guide how the game world is shaped by other players. Players may shape the timeline in broad strokes by adding new eras to the world’s history, or fill the timeline out in more detail by adding events and scenes to the timeline. Players can pick and choose content to fit with what they want to see in the game world, and thus shape the world to their choosing.

*5.2.2 Adaptable Game World.* The game world in *Microscope* is made to be highly extensible to allow players the most freedom in adding new events to the game world. While the players are not allowed to add anything to the world that contradicts what has been previously stated as true about the world, players are able to add new events, scenes, and eras at any point in the timeline, changing the game world by adding new moments in the history of

the game world. Because the game world largely exists as text and within the imaginations of the players, the game world can be easily modified and added to during play. This also allows the system to support a large range of stories, with players able to choose any setting for their game world and expand upon it as they see fit.

**5.2.3 Moderated Game World.** All players of *Microscope* are seen as equal creators of the world, and thus there is no player hierarchy in determining what is and what isn't added to the game world. Instead, player moderation largely comes in two forms within play. The first is in a player-determined palette at the start of the game. Before making the game world, players collaboratively create a palette of things they wish to see and not see in this world. Each player takes a turn to add an item to the palette, either adding an item to the "Yes" column for items they want to see, and to the "No" column for items they want to ban. Player must collectively agree to all items on the palette. The rulebook for *Microscope* discusses this negotiation with the example of players choosing elements of the palette for a space-themed game:

Another player adds "aliens" to the Yes column; she's not sure the other players want aliens in this setting, so she wants to find out now. Other players want to keep space mysterious, so after some discussion a different player adds "communication with aliens" to the No column. There may turn out to be aliens in the game, but there will be no way to talk to them. [16]

The creation of the palette thus provides the basis for moderating the content of the co-created world, allowing players to determine from the outset what will and will not exist in that world.

The second way players can moderate worldbuilding is through roleplay. When playing out scenes, specific events that happen within the game world, the player instantiating the scene may determine which characters will and will not be in the scene. This allows the scene's creator more control of which characters are important to the scene, and more power in shaping that part of the game world.

## 6 CONCLUSION

This paper addresses games that feature co-creative games that feature the shaping of game worlds at the core of their gameplay, identifying this process both through examples and looking at the overarching features of games that allow for this process. Through this examination, we can understand the key features of game world co-creation, allowing us to better identify this process in existing games and create games that better allow for this co-creative process in the future. By allowing the player this secondary role as maker, the player has the ability to change what is in the game world both for themselves and other players. This allows for a new kind of relationship between the game's creators and its players, blurring the lines between game authorship and play. Furthermore, it builds into the system the explicit values of shared, collaborative worldbuilding between players, allowing for new kinds of player-driven stories and worlds in which the player is a driving force for creation.

Identifying this co-creative process is significant because it provides us with a new way of examining collaborative storytelling in games, through the lens of co-creation of game worlds. This

approach lets us see how new kinds of player-driven stories can arise through the shared manipulation of game worlds by players, and more generally how the player takes on the role of authorship through play in these kinds of games.

Future work in this area can involve further developing the definition and boundaries of games included in the discussion of game world co-creation. More specifically, it can further address which games may or may not exist within this definition, and further discuss game stories versus game worlds as artifacts of play. Further work can also examine the challenges to creating games that effectively facilitate game world co-creation. In allowing players a degree of authorship, this could lead to the same difficulties that can make other forms of creative work difficult, such as being faced with a blank slate. We can look at how these games scaffold the creative process and allow such creativity in a collaborative setting.

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