



HAL
open science

Murder on Mansion Hill: Encouraging Collaborative Group Storytelling to Improve Motivational Aspects of Literacy Using Gameplay and Arts-Based Techniques

Simone Downie

► **To cite this version:**

Simone Downie. Murder on Mansion Hill: Encouraging Collaborative Group Storytelling to Improve Motivational Aspects of Literacy Using Gameplay and Arts-Based Techniques. 20th International Conference on Entertainment Computing (ICEC), Nov 2021, Coimbra, Portugal. pp.46-61, 10.1007/978-3-030-89394-1_4. hal-04144388

HAL Id: hal-04144388

<https://inria.hal.science/hal-04144388>

Submitted on 28 Jun 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License



This document is the original author manuscript of a paper submitted to an IFIP conference proceedings or other IFIP publication by Springer Nature. As such, there may be some differences in the official published version of the paper. Such differences, if any, are usually due to reformatting during preparation for publication or minor corrections made by the author(s) during final proofreading of the publication manuscript.

Murder on Mansion Hill: Encouraging Collaborative Group Storytelling to Improve Motivational Aspects of Literacy Using Gameplay and Arts-Based Techniques

Simone Downie^[0000–0003–4664–199X]

The Ohio State University, Columbus OH 43210, USA
downie.42@osu.edu

Abstract. Literacy is a complex term that involves an array of intertwined processes, including motivation. Students who lack this internal willingness often fail to engage with books and other literacy-related content, which in turn negatively affects their learning outcomes. Though several arts-based strategies have been shown to improve students' involvement in reading, these approaches can be difficult and time consuming to implement. *Murder on Mansion Hill* is a digital tabletop game designed to weave together literacy-improving creative techniques such as storytelling, collage, and co-design in a cohesive manner. By blending these strategies with the motivational benefits of gameplay, *Mansion Hill* encourages players to take a highly active role in developing and sharing imaginative narratives, helping them to view stories as an enjoyable and rewarding outlet they can share with friends. After a series of improvements made through player feedback, players felt the game helped them overcome fear of judgment, engage with narrative in new multimodal ways, and bond with peers.

Keywords: Educational games · storytelling · literacy · collage · co-design.

1 Introduction

The definition of literacy has grown beyond preparing children how to decipher the contents of a book. As we now understand it, literacy is a term that encompasses a wide array of reading and writing behaviors that develop naturally as individuals engage with books, songs, play, and other language-rich activities [1]. It relies on the unification of tools, critical thinking, and socio-emotional strategies to communicate, consume, and create meaning [2]. Included in these critical behaviors is willingness. Knowing how to navigate one's way through a sentence is one thing; actually doing it is another. While there are well-documented benefits to students spending time with book-related content, there is also a notable lack in some of their willingness or desire to do so. This phenomenon, known as aliteracy, is unfortunately on the rise as students spend less and less time reading for pleasure both during and after elementary years [3].

This reluctance can be caused by a variety of factors. It can occur when students come to view literacy as an outcome rather than a process, and fear that they will be considered “dumb” if they make a mistake [4]. Others may view reading as a submissive act in which their creativity and desires are not valued. Such students view books as something to be received and decoded, a task that sounds boring and uninteresting [5]. Additionally, some learners may feel constrained by traditional text and require other types of tools that better support how they make meaning and express themselves to peers [6].

The game described in this paper was developed to help combat these aliteracy-related factors by encouraging players to view stories as highly interactive social acts, and themselves as capable storytellers. To achieve this, *Murder on Mansion Hill* leverages the motivational benefits of gameplay, storytelling, collage, and co-design to support players as they craft imaginative stories in a group-based setting. It gives participants greater control over game construction and story through the use of arts-based collaborative tools to support their desires and choices, with the goal to motivate players to approach narrative in new visual ways and come to view stories as rewarding and fun. By crafting stories within the game, players gain hands-on experience using multimodal techniques that can help them form a positive relationship to literacy-related content.

2 Self-Determination Theory and Intrinsic Motivation

Aliterate students often lack the internal desire to engage with literacy-related activities. In other words, they fail to experience intrinsic motivation, a concept found in Self-Determination Theory (SDT). According to this theory, individuals have an innate psychological need for feelings of autonomy, competence, and social relatedness [7]. Respectively, these categories relate to the sense that your actions are your own, that you have influence on your environment, and that you feel a sense of connection to others. When these three needs are met, individuals experience intrinsic motivation, which is the “the pursuit of an activity because it is inherently interesting or enjoyable” [7, p. 526].

When students feel intrinsically motivated to engage with books, not only do they increase the amount of time spent reading, but they feel more engaged and experience higher levels of enjoyment, which in turn result in greater learning outcomes [3, 8]. A range of studies highlight the positive effect that feelings of autonomy, competence, and relatedness have on literacy learners – from choosing more challenging activities and increasing effort [4]; experiencing higher levels of visualization, comprehension, and memory [5]; sharing more knowledge and engaging in more meaningful conversations with peers [6]; and performing significantly higher in comprehension and subject matter knowledge measures [9].

Murder on Mansion Hill brings together creative techniques shown to have positive effects on intrinsic motivation in educational environments, including gameplay, storytelling, collage, and co-design. On their own, each of these elements serves as a promising tool for increasing engagement and academic progress; however, experts also caution that their success is dependent on how well these

techniques are integrated and scaffolded within the learning experience. For example, Kao et al. highlight how game-based platforms improperly designed with too much incongruent multimedia can cause children to ignore their learning goals and decrease reading comprehension [9]. Similarly, Kaimal et al. found that average university students experienced greater anxiety and decreased creative expression without an art therapist there to help them negotiate visual challenges and decisions [10]. *Mansion Hill* removes the burden of navigating these strategies from parents, educators, and students alike by providing a structured gameplay experience that guides players through the use of these tools and demonstrates ways they can be combined to benefit one another. The motivational aspects of these techniques are briefly described in the following sections.

2.1 Motivation and Degrees of Interactivity

Games have a way of inspiring players in incredible ways – from spending countless hours cultivating a virtual farm to combating impossible bosses over and over until one finally wins. This internal motivation is the result of several game-based best practices [11–13]. For starters, many games view learning as a process and allow for experimentation and variety as players attempt to reach a goal. Rapid feedback and rewards can help players see failure as a positive learning opportunity to adjust their understanding and approach, and not as a negative punishment. To list a few more examples, games also break goals into sub-tasks to reduce complexity, encourage players to try new identities and express multiple sides of themselves, and create a platform for social connection.

Despite similar best practices to encourage motivation, some games support different levels of interactivity – and thus autonomy – than others. Interactivity is the relationship between two things as they act upon one another, such as a player pressing a button and the system responding to that input; however, there is a difference between the type of interactivity that occurs when you progress a narrative, when you make a choice that effects the narrative, or when you make up an entirely new one [14]. These degrees of interactivity are reflected in common game design patterns, defined here using categorizations by Yannakakis et al. [15]. For example, in ‘free expression’ games such as *Farmville* [16] players spend time decorating aspects of their characters and environment, however, their choices have little to no effect on the structure of game. ‘Customization’ games are slightly more interactive as players’ choices do have some impact, such as in *World of Warcraft* [17] in which choosing a class results in a different set of quests. Still, the player’s affect over the system remains shallow, with her choices limited to picking between pre-determined aesthetics and outcomes.

To better support player autonomy, *Murder on Mansion Hill* integrates ‘construction’ and ‘combining’ patterns. Players begin the game by placing together images to construct collages that will become the pieces of the board and influence the card deck. This type of free-form making – which can be seen in *Minecraft* [18] and *Fortnite Creative* [19] as players use virtual materials to architect anything from buildings to entire game experiences – tightly integrates player’s choice and preferences into the mechanics, design, and narrative of the

game. No two games of *Mansion Hill* look the same, have the same outcomes, or follow the same story; each playthrough is dependent on players' custom-made artefacts and creative interpretation. The goal of supporting this deep level of interactivity is to encourage players to feel as though their choices deeply matter and that their creativity is critical to the game.

2.2 Creative Storytelling and Collage

Though storytelling is often thought of as a solo act, it can also incorporate multiple voices and give participants a much more active role. For example, many classrooms and libraries use a dialogic approach to storytime, in which the narrator routinely pauses to ask questions, encourage discussion, and allow students to imagine new parts of the story [20]. When participants are encouraged to listen to and interpret stories with others, they are more likely to grow intellectually, creatively, and psychologically [21], and feel a deeper sense of belonging and comradery. Additionally, when learners share their creativity with others, they feel more motivated to continue engaging in the act, as they realize the value of their contribution and feel appreciated by the group [22].

Classrooms are increasingly incorporating other multimodal techniques to encourage readers to playfully embody and communicate meaning. One such tool is collage, which is the process of collecting, editing, and gluing visual materials. Because collage relies on found visual objects, it requires makers to abstract complex ideas and challenge and refine their understanding as they attempt to communicate using available materials [23]. As individuals explore meaning in this active manner, they feel a heightened sense of positive affect, self-efficacy, and creative agency [10, 24]. When used in the classroom, collage helps learners recognize that there is more than one way of knowing and that their imagination and personal interpretations are critical, an awareness that transfers to reading [5, 25]. Importantly, collage also provides an accessible, safe structure that allows participants of any experience level to not feel limited by artistic ability or fear of judgement [26].

Storytelling and collage rely on inspiration and imagination, which can be difficult to inspire. However, games can address this concern by fostering possibility thinking and creative emotional reasoning [27]. According to these concepts, creativity emerges when a person is prompted to think in a non-linear fashion or in a way that is not his norm, a process fueled by imagination as he is provoked into conceptualizing new ideas and connections. The key terms used in that description were 'prompted' and 'provoked' – this type of logic relies on the concept of a disruptor that stimulates an emergent, open-ended line of inquiry. As players explore possibilities that take the trigger into account while meeting the requirements of the game, they challenge their associations, understandings, and ways of making meaning [28], a semiotic process similar to the logic found in collage making and reading.

Like *Murder on Mansion Hill*, games such as *Story Cubes* [29], *Once Upon a Time* [30], and *Mysterium* [31] encourage on-the-fly imaginative storytelling through the use of such disruptors. For example, in *Once Upon a Time*, players

must create a coherent fantasy story using randomly dealt cards containing key words. As they try to connect their words, new cards and storylines are continually introduced by other players, forcing each player to reconceptualize what they might say next. So as not to be overwhelming, the open-endedness of these possibilities is restrained by the goal of leading the story toward a final ending card. Similarly, in *Mysterium*, players are handed visual cards with abstract, surrealist art that they must interpret to solve a mystery, a task that constantly evolves as each player is given more cards to refine and debate their associations. *Murder on Mansion Hill* mimics these mechanics as players use the cards in their hands and the collage-based visual board to craft new narratives and uncover a series of clues.

2.3 Co-Design and Facilitation

To further fulfill elements of SDT – and to blend the above elements in a cohesive manner – *Murder on Mansion Hill* employs a co-design approach. At its core, co-design is a research methodology that frames the participant as the expert. Instead of assuming that the designer must single-handedly account for all user wants, needs, and perspectives, co-design instead *asks* the user what her goals and desires are and provides hands-on collaboration tools for communicating and debating these wants with a group of her peers. The designer’s role is not that of a subject matter expert but instead a facilitator, there to guide the group’s time together, explain and demonstrate activities, and help synthesize understanding.

Though games are a popular tool used within co-design activities, there are few examples of a game being the *end result* of such sessions, as is the case with *Mansion Hill*. However, popular tabletop Role Playing Games such as *Dungeons and Dragons* [32] serve as an example of merging a co-design approach with gameplay. In many ways, the designer and Dungeon Master (DM) have similar roles, serving as a facilitator to ensure the experience benefits and supports each unique collection of participants. To achieve this, they help everyone understand the rules and expectations while encouraging individual expression, are highly engaged and lead by example, and are willing to pivot and adjust [33]. Balancing exploration with guidelines helps steer participants’ attention in a positive direction and gives the sense that there are still goals to be accomplished. The perception that there are tasks to be finished and that they can be completed in whatever way feels enjoyable to the player increases intrinsic motivation and strengthens involvement in the activity [11].

3 Description of the Game

3.1 Setup

Murder on Mansion Hill is setup and delivered digitally on a web-based whiteboarding platform called Miro (alongside a video-chat application such as Zoom or Discord). Because Miro is intended for team-based collaboration and visualization, it lacks many automation and coding features found in game development

software. However, its lack of technical complexity also makes it a promising platform for tabletop games as it enables quick iteration, is accessible and free to any internet-connected device, and is easy to use. These features support the creation of a remote game that connects family and friends who may not live in the same location or are socially distanced.

Because Miro lacks automation, some set up is required by the lead Game Master (GM). The game materials can be made from scratch or the GM can use pre-packaged templates that include: one design Miro board; one gameplay Miro board; 150 story cards pre-populated with places, items, characters, and actions; 52 poltergeist cards; collage building assets; avatar tokens; and pre-determined links between collage items and story cards (described in Figure 2). The remaining story cards are left blank to be filled in later by players. Links to the Google Drive documents that populate these blank cards are provided in each player’s workspace within the design template. The GM may modify the story cards, the collage assets, and the cards to which the collage items are assigned.

3.2 Narrative and Setting

Players take on the role of psychic medium students who are given their final assignment to uncover what happened to the Master of the Mansion at the top of the hill, who recently disappeared in a mysterious fashion. The first group to successfully get in touch with their spooky side and correctly solve the murder gets infinite bragging rights and an automatic A. What exactly happens during the game and what the Mansion looks like is entirely up to the players as they use their imagination to describe their journey through the rooms, the interesting characters they interact with, and any other observations or actions of note. Players should think of the game as a story, and themselves and their fellow teammates as the storytellers, building on-the-fly narratives to search around and decipher clues.

3.3 Pre-Game Design Session

A major goal of the game is to give players heightened creative control, including over physical game components. In a pre-game design session, which takes 30-45 minutes, players use collage to construct the board and determine contents of the story card deck. In the provided Miro template, each team is given a collage workspace (Figure 1) that resembles a worksheet with the title of the Mansion’s rooms or a fill in the blank space above an empty square. Each player first claims three rooms that they want to design, either by verbally reserving a room already included in the workspace or moving an available room title above a square in their team’s board. Next to the workspace are the images to be used for the collages, categorized into background rooms, items, characters, and so on. Players use drag and drop or copy and paste to move these visual assets into their empty squares to create their rooms (Figure 2). They then click on

hyperlinks provided beneath their workspace to type a short description of their new environments into a series of Google Drive documents (Figure 3).

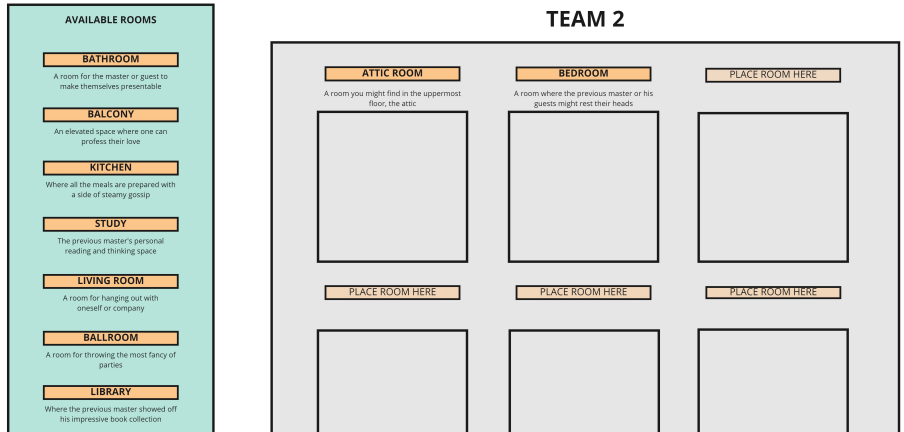


Fig. 1. Closeup view of collage workspace. Collages are built within each square using a provided collection of visual assets

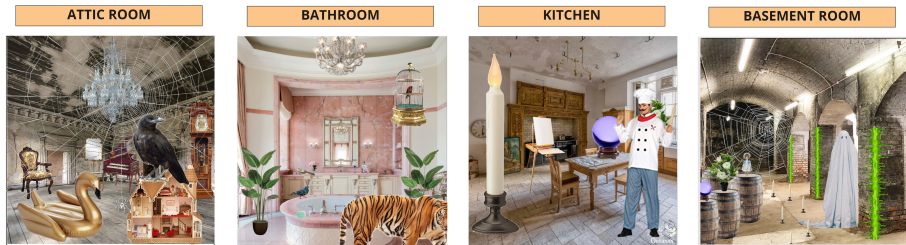


Fig. 2. Examples of rooms created by players using collage techniques.

This phase most closely resembles a co-design session with the GM guiding others through the activity, ensuring the group is moving at the same pace and staggering tasks to reduce complexity, answer questions, and encourage casual conversation. For example, Miro allows assets to be grouped together and hidden (grayed out) by the main account. Using this functionality, the GM reveals each category of images one at a time, giving players time to choose their background setting, and then their items, and then their characters in sequential order. When players have completed their collages, the GM is also responsible for moving the rooms from the workspace to the game board and aligning the images used in the collages to the story card deck. Figure 3 diagrams this process.

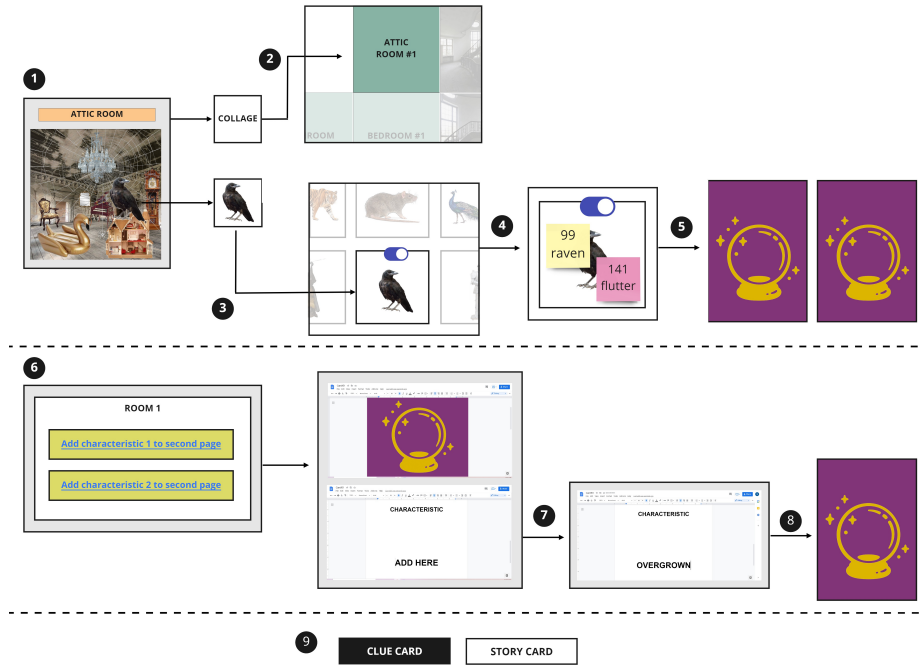


Fig. 3. Player collages influence game content as follows. 1: Player 1 collages the attic room. 2: The GM places the collage on the game board beneath its tile. 3: The GM assesses which elements are 'in use' (marked by a toggle the player set to active). 4: The GM looks at the notes hidden beneath the active element. These notes list the story cards assigned to that element (as determined by the template or the GM) 5: The GM copies these cards into the gameplay Miro board. 6: Player 1 follows the first link included in her collage workspace to open a Google Drive document. 7: Player 1 replaces the ADD HERE text with a word that describes the room. 8: Player 1 repeats this two times per room. Each Google Drive document is linked to a characteristic story card; when changes are made to the document, they also appear on the card. The GM refreshes the characteristic cards and deletes any not in play. 9: The GM chooses two place, action, and item cards at random and deals them to a member of each team to become their clue card. The rest are shuffled into the deck to become story cards.

3.4 Playing the Game

Once the design stage is finished, it's time to play (Figure 4). Players act as psychics working together in two competing teams to determine how the opulent owner of the mansion was killed, in what room, and with what item. To accomplish this, players navigate their avatars around the mansion while using the five story cards in their hand and the visual contents of the board to weave a story. For example, if you have the story cards witch, cauldron, and basement, and a room that includes green smoke, you may describe a scene in which you move down to the basement only to uncover an old witch hiding among the dusty shelves, stirring a smoking cauldron full of suspiciously green liquid. If you use a place story card to move your chosen avatar to a new room, you remove the tile to uncover the collage beneath it.

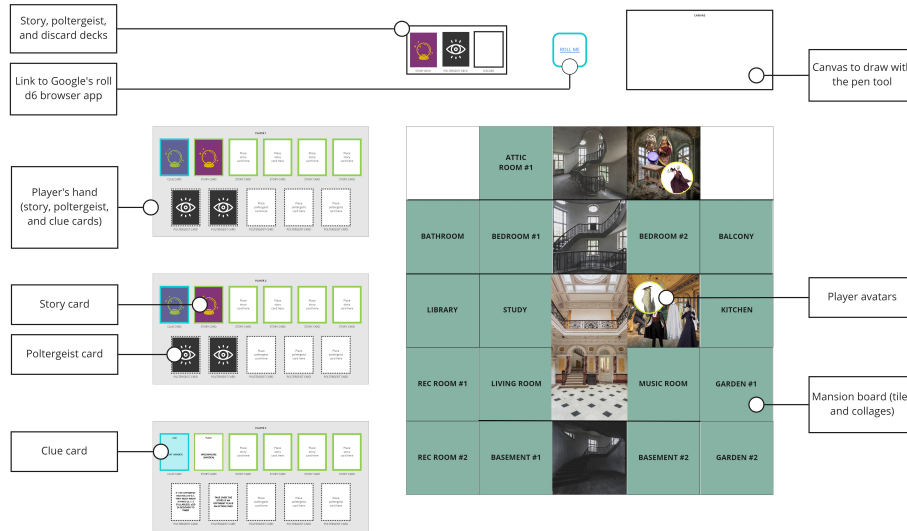


Fig. 4. Diagram of Murder on Mansion Hill board.

Each player also possesses one secret clue card that contains the answer to one piece of the murder mystery. When the current narrator says a word related to a story card in a teammate's hand, that teammate is overtaken by his psychic powers; he rolls a die to determine in what creative way he must hint at the contents of his clue card, such as by writing a riddle or drawing a picture. But look out, other players may use their poltergeist cards to make the clue-giving process just a bit trickier. Once a team correctly guesses all three parts of their murder mystery, they win by crafting one final sentence describing what caused the Master's ultimate end.

4 Playtest Results and Findings

Murder on Mansion Hill is intended for players of any age, even those beyond the K-12 demographic. Based on the author’s personal observations, adults also struggle to engage with literacy-related content and activities. For this reason, undergraduate and graduate students enrolled in Computer Science, Design, Arts Administration, and Theater courses were recruited as playtesters, due to the author’s familiarity and involvement in these classes. These individuals, who were a blend of male and female, responded to verbal and social-media based advertisements seeking out participants; as the intent of the study was to play the game with as general a segment of the population as possible, no further selection criteria were used. Because *Murder on Mansion Hill* is intended for six players, the 15 original participants were divided randomly into three test groups, with the author serving as the sixth player and GM in each. A polling system was used to gather availability and schedule play sessions.

Prior to playing, participants filled out an anonymous online survey to better gauge their experience with techniques used in the game (two participants left the study before providing their responses). Pre-game survey questions and responses are provided in Table 1. Participants were close to evenly spread out in how often they play games, how comfortable they felt telling stories to others, and their level of experience with co-design if they were familiar with the term (which about half were). Seven participants recall having made a collage in their adult life and enjoyed the process, while the rest were unsure. Most had almost never authored creative works of fiction. Of those with experience playing story-based games like *Dungeons and Dragons*, only a minority talk a lot to guide the narrative. Participants without experience engaging in such games identified several roadblocks preventing them from playing, such as difficulty finding a group, feeling self-conscious due to lack of experience, and wanting someone to guide them through the process. Interestingly, nearly all participants report being drawn to games in which their choices have a large impact on gameplay because it adds to replay-ability, gives them a heightened sense of agency, requires deeper thinking, and makes the game experience more personal.

4.1 Playtest 1

In the first playtest, players were given even greater control over game elements than described in previous sections. Instead of only creating six words for the characteristic cards, players were instead asked to populate the entire story card deck. This required each player to open 16 Google Drive documents to insert their words, a process that required an unforeseen amount of time due to internet bandwidth and individual pace. Players were also given creative freedom to collage any type of room they wanted, instead of being limited to rooms found in a set blueprint. With this much to create, the design phase pushed well past an hour. At that point, players vocalized concerns that they had other engagements to attend to and that they were losing energy. The game session was thus completed another day.

Table 1. Pre-Game Survey Results.

| Questions | Responses | | | |
|---|-----------|-------|----|-------|
| Multiple choice: Yes, No, Other | | | | |
| 1. Do you have experience playing games based heavily on imagination and story, such as Dungeons & Dragons? | Yes | 53.8% | No | 46.2% |
| 2. Have you ever designed a game? | Yes | 69.2% | No | 30.8% |
| 3. Do you know what co-design is? | Yes | 53.8% | No | 46.2% |
| 4. Have you ever made a collage? | Yes | 76.9% | No | 23.1% |
| 5. If yes to # 4, have you made a collage in your adult life? | Yes | 70% | No | 20% |
| | Unsure | | | 10% |
| 6. If yes to # 4, do you enjoy making collages? | Yes | 70% | No | 10% |
| | Unsure | | | 20% |
| On a scale of 1-5 with 1 most negative and 5 most positive. Listed as averages | | | | |
| 7. If yes to # 1, how much do you typically talk to lead the story? | 2.71 | | | |
| 8. How often do you author creative pieces of fiction for fun? | 1.77 | | | |
| 9. How comfortable would you feel reciting a story to a stranger? | 3.23 | | | |
| 10. How often do you play games? | 3.61 | | | |
| 11. If yes to # 3, what is your level of experience with co-design as a participant or designer? | 3.14 | | | |
| Freeform response with why or why not explanation | | | | |
| 12. If no to # 1, are these games something you've been wanting to try? | | | | |
| 13. What types of games are you drawn to? | | | | |
| 14. Are you drawn to games in which your choices have a large impact on gameplay? | | | | |

In addition to time concerns, giving players complete control over the cards and types of rooms resulted in a difficult play experience. While some players kept their cards simple, others created more complex phrases like ‘very old bread’ or used more sophisticated language such as ‘jubilant’. Other cards, such as mouse, appeared so many times it became comical. The rooms followed suit, with a combination of quirky and highly repetitive visuals. These factors made it difficult for players to tell stories using language that might relate to the rooms and one another’s cards. Players were stuck leading the narration for too long which caused them to experience anxiety and feel unsure of themselves. This hesitance, along with the fact that there were no characters or avatars to embody, pulled them out of the game world. Meanwhile other players felt disengaged because they were unable to take a turn. On a positive note, players did find the collage making process enjoyable, and appreciated that the board provided a visual representation of how the story was developing.

4.2 Playtest 2 and 3

Some degree of player control during the design stage was subsequently reduced to strike a better balance between player- and designer-made assets and ensure a better sense of cohesiveness. The mansion board was re-imagined to contain a set organization of rooms that players could choose between to guide their

collages (Figure 3). Next was to better align story cards and reduce the time spent creating them while still ensuring player decisions determined game content. Since players were already making choices to populate their collages, it seemed promising to connect these decisions to card content instead of creating another time-consuming activity (Figure 2). Though with this new approach either the template or GM determines which words/cards the collage items relate to, players still noticed that their collages influenced the contents of the story deck. Character avatars were also introduced to provide players with a conduit to better immerse themselves in the game world.

After these changes, the design phase moved more quickly, leaving more time for play and better keeping players engaged. During the game, narrators were better able to lead a story that connected to other player’s hands and use the board in a more meaningful way. One player shared his appreciation for how the game adjusted to his experience level in telling stories and how gameplay was highly dependent on the group’s personality – more serious players can approach the game differently than beginners, who might allow more “ridiculous” things. The introduction of avatars was also beneficial. On several occasions, and unprompted, players introduced their personas (chosen from a collection of fantasy based characters) and provided a backstory and personality, which they then used throughout the game. Players echoed the first playtest group in how much they enjoyed the collage making process. Not only did they find the collages “extremely” fun, but several players voiced that they appreciate the organic social conversation that blossomed as players moved through the activity. Though players were creating their own individual rooms, they still felt like they were building within a group setting.

4.3 Survey Results

The three groups completed an additional anonymous online post-game survey to better understand their experience and whether they felt motivated to engage with story in a new way. Eight of the original thirteen participated. Table 2 compares the results between the first group (four survey participants) and the second and third groups (four survey participants total).

On average, participants in the second and third playtests more greatly enjoyed the design stage, telling imaginative stories, and crafting collages, and found that the visuals were more helpful in crafting narratives. All players in the first group wished for more pre-made assets while no one in the following groups felt the same, indicating that removing some of the creative burden from players during the design stage was a welcome change. Some players in the third group voiced that they liked the balance between player-made and designer-made assets, but felt they would gradually want to claim more control as they grew more comfortable with the game (a desire the structure of the game can easily support). After playing, most players felt more inclined to play other narrative-based games, felt their experience was positively impacted by the collage making process, and felt a sense of comradery with peers. A main area for improvement is better onboarding players so they better understand the rules of the game.

Table 2. Post-Game Survey Results.

| Questions | Group 1 | Groups 2&3 | | |
|---|---------|------------|--------|------|
| On a scale of 1-5, with 1 most negative and 5 most positive. Listed as averages | | | | |
| How did you find the experience of creating components of the game, such as the board art and card items? | 3.75 | 5 | | |
| How would you rank your level of engagement in the game? | 4.5 | 3.25 | | |
| How was the experience of telling on-the-fly imaginative stories as part of the game play? | 2.5 | 4.5 | | |
| How was the process of making digital collages? | 2.5 | 4.75 | | |
| Were the collages helpful in creating narrative stories? | 2.5 | 4.5 | | |
| Multiple choice – Yes, No, Other | | | | |
| Would you have preferred more pre-made assets? | Yes | 100% | No | 100% |
| Would you have preferred more opportunities to create items, visuals, or rules? | No | 100% | Yes | 25% |
| | | | No | 50% |
| | | | Maybe | 25% |
| Do you feel more interested in playing other narrative-based games like Dungeons & Dragons? | Yes | 100% | Yes | 75% |
| | | | No | 25% |
| Did building collages positively impact your interest? | Yes | 100% | Yes | 100% |
| Did you understand how to play and win the game? | Yes | 50% | Yes | 50% |
| | No | 50% | Mostly | 50% |
| Did you feel a sense of comradery with your team and peers? | Yes | 100% | Yes | 100% |

The survey also included some freeform questions to allow players to provide feedback in their own words. Table 3 lists these questions.

Table 3. Freeform Post-Game Survey Questions.

| Questions |
|---|
| 1. How was your interest affected by your role in creating components of the game? |
| 2. Did you become more comfortable with your role as a storyteller over time? Why or why not? |
| 3. In the pre-game survey you answered questions related to how often you create stories and how comfortable you are in sharing them with others. After playing this game, would your responses change? |
| 4. Is there anything you would add to make this game more enjoyable? |

According to responses, all playtesters became more invested in the game due to their creative contribution and found that playing with their own assets as opposed to someone else's created a more rewarding and exciting game experience. One player said that she wished she better understood the connection between her choices and the game content so that she could make decisions more carefully. Nearly all players also found that they became increasingly comfortable with their role as a storyteller. This was in large part due to growing more com-

comfortable with the group and recognizing that no one was there to judge, as well as having the cards and board to provide creative guidance. However, players were hesitant to say whether playing the game helped them feel more comfortable sharing stories outside of the game context. Some players suggested that repeated engagement with the game may have this benefit, while others remained unsure if their newfound confidence could only exist in the safe environment of the game. In terms of suggestions, players wished for more opportunities to explore a greater number of rooms and to use their poltergeist cards. Players also stated an interest in establishing a team mentality during the design phase, as opposed to being assigned teams after the collage activity.

5 Limitations and Future Improvements

Though the size of the study was admittedly small, insights gained from survey results and verbal feedback are generally promising. After undergoing some design changes, *Murder on Mansion Hill* successfully created a playful environment that naturally adjusted to each session's unique makeup of players, helping individuals from different academic backgrounds, gaming experiences and interests, and creative confidence levels feel comfortable with one another as they engaged in arts- and story-based tasks. Participants felt motivated to play the game, an interest that in turn encouraged them to step out of their comfort zones and engage with imaginative narratives. Additional game sessions would be beneficial to gather a greater number of survey responses and combine more player personalities and experiences to see if these positive impressions remained true. As some game mechanics were slightly tweaked after the latest round of playtests – such as dividing the collage making workspace into two team environments and giving players two poltergeist cards to start – further playtests would also be beneficial to continue testing game mechanics.

Much of the effort for future improvements should focus on two main concerns: better onboarding players so they feel more comfortable with the rules and expectations and addressing uncertainty as to whether the literacy-related techniques leveraged within the game can extend into real world contexts. Because each playtest in this study was comprised of different players, it may be beneficial to play multiple sessions with the same participants to uncover whether prolonged engagement has an impact on players' understanding of the rules and their longer-term perception of arts-based techniques, storytelling, and resources (such as games) that leverage them. The data gathered in this survey was also largely impression-based, with players self-reporting feelings and insights that are difficult to quantify. This was due to the author's main goal of creating a game experience that supported player's intrinsic motivation, a concept that is largely personal and perception-based. As the game's ability to support elements of SDT is encouraging, further studies should introduce metrics that better measure literacy-related progress and explore the potential of *Mansion Hill* to support reading motivation outside of the game world.

6 Conclusion

Murder on Mansion Hill blends together elements of co-design, collage, and group storytelling in a cohesive manner to create a game-based experience in which players feel intrinsically motivated to express and explore their narrative creativity together with peers. It gives players control and agency to create and play a game based on their unique imagination, balancing player-made assets with pre-made designs in a way that allows for player input while providing a guiding foundation of rules and goals. The whimsical setting, visual collages, and story cards work together to help players view themselves as capable storytellers and the process of weaving unique stories as an enjoyable, lighthearted social experience. Future improvements should focus on more explicitly encouraging players to leverage the multimodal meaning making techniques used in the game to outside literacy-related contexts.

References

1. Urban Libraries Council: Making cities stronger: public library contributions to local economic development. Urban Institute (2007)
2. Maureen, I. Y., van der Meij, H., de Jong, T.: Supporting literacy and digital literacy development in early childhood education using storytelling activities. *International Journal of Early Childhood* **50**(3), 371-389 (2018)
3. De Naeghel, J., Van Keer, H., Vansteenkiste, M., Haerens, L., Aelterman, N.: Promoting elementary school students' autonomous reading motivation: Effects of a teacher professional development workshop. *The Journal of Educational Research* **109**(3), 232-252 (2016)
4. Johnston, P. H.: *Opening Minds: Using Language to Change Lives*. Stenhouse Publishers (2012)
5. Wilhelm, J.: Reading Is Seeing: Using Visual Response to Improve the Literary Reading of Reluctant Readers. *Journal of Reading Behavior* **27**(4), 467-503 (1995)
6. McGlynn-Stewart, M., Brathwaite, L., Hobman, L., Maguire, N., Mogyorodi, E., Park, Y. U.: Inclusive teaching with digital technology: Supporting literacy learning in play-based kindergartens. *LEARNing Landscapes* **11**(1), 199-216 (2017)
7. Mekler, E. D., Brühlmann, F., Tuch, A. N., Opwis, K.: Towards understanding the effects of individual gamification elements on intrinsic motivation and performance. *Computers in Human Behavior* **71**, 525-534 (2017)
8. Yoon, J. C.: Three decades of sustained silent reading: A meta-analytic review of the effects of SSR on attitude toward reading. *Reading Improvement*, **39**(4), 186-196 (2002)
9. Kao, G. Y. M., Tsai, C. C., Liu, C. Y., Yang, C. H.: The effects of high/low interactive electronic storybooks on elementary school students' reading motivation, story comprehension and chromatics concepts. *Computers and Education* **100**, 56-70 (2016)
10. Kaimal, G., Mensinger, J. L., Drass, J. M., Dieterich-Hartwell, R. M.: Art Therapist-Facilitated Open Studio Versus Coloring: Differences in Outcomes of Affect, Stress, Creative Agency, and Self-Efficacy. *Canadian Art Therapy Association Journal*, **30**(2), 56-68 (2017)

11. Rapp, A.: Designing interactive systems through a game lens: An ethnographic approach. *Computers in Human Behavior* **71**, 455-468 (2017)
12. Simões, J., Redondo, R. D., Vilas, A. F.: A social gamification framework for a K-6 learning platform. *Computers in Human Behavior* **29**(2), 345-353 (2013)
13. Cruz, C., Hanus, M. D., Fox, J.: Players' perceptions and uses of extrinsic meta-game reward systems for video game consoles. *Computers in Human Behavior* **71**, 516-524 (2017)
14. Zimmerman, E.: Narrative, interactivity, play, and games: Four naughty concepts in need of discipline. *First person: New media as story, performance, and game* **154**, (2004)
15. Yannakakis, G. N., Eladhari, M., Hullett, K., Knight, Y., Brown, D., Liapis, A.: Creative Emotional Reasoning Computational Tools Fostering Co-Creativity in Learning Processes. *C2 Learn*, (2013)
16. Zynga: Farmville. [Video game] (2009)
17. Blizzard Entertainment: World of Warcraft. [Video game] (2004)
18. Mojang Studios, Sony Interactive Entertainment: Minecraft. [Video game] (2011)
19. Epic Games: Fortnite Creative. [Video game] (2018)
20. Albright, M., Delecki, K., Hinkle, S.: The Evolution of Early Literacy. *Children and Libraries* **7**(1), 13 (2009)
21. Diamant-Cohen, B.: First Day of Class: The Public Library's Role in School Readiness. *Children and Libraries* **5**(1), 40-48 (2007)
22. Koulouris, P., Dimaraki, E. V.: Fostering Co-Creativity in Learning Through Digital Gaming: Educational Scenarios Developed by School Communities Co-Designing the C2Learn Solution. *EDULEARN14 Proceedings*, 4204-4213 (2014)
23. Chilton, G., Scotti, V.: Snipping, gluing, writing: The properties of collage as an arts-based research practice in art therapy. *Art Therapy* **31**(4), 163-171 (2014)
24. Kaimal, G., Ray, K.: Free art-making in an art therapy open studio: changes in affect and self-efficacy. *Arts and Health* **9**(2), 154-166 (2017)
25. Siegel, M.: Rereading the Signs: Multimodal transformations in the field of literacy education. *Language Arts* **84**(1), 65-77 (2006)
26. Raffaelli, T., Hartzell, E.: A comparison of adults' responses to collage versus drawing in an initial art-making session. *Art Therapy* **33**(1), 21-26 (2016)
27. Stouraitis, E., Agogi, E.: Fostering Creativity in Sixth Grade History Education Through a Storytelling Digital Game: An Empirical Study. *History Education Research Journal*, **13**(2), 138-149 (2016)
28. Liapis, A., Hoover, A. K., Yannakakis, G. N., Alexopoulos, C., Dimaraki, E. V.: Motivating Visual Interpretations in Iconoscope: Designing a Game for Fostering Creativity. (2015)
29. Zygomatic Games: Rory's Story Cubes. Tabletop game (2004)
30. Atlas Games: Once Upon a Time. Card game (2012)
31. Nevskiy, O., Sidorenko, O.: Mysterium. Tabletop game (2015)
32. Wizards of the Coast: Player's Handbook, 5th Edition. Tabletop game (2014)
33. Buraparate, P.: Dungeons and Dragons and Design Thinking. UX Collective, <https://uxdesign.cc/dungeons-dragons-design-thinking-688a0b7cca3f> (2019)