Escape Rooms for Misinformation Education: A Case Study of Co-design with Two Communities

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ABSTRACT

This case study explores the application of co-design to develop digital misinformation escape room games tailored to two distinct communities, an interest-based group (music fans) and a subset of the general population united by shared identity (the Black community). Motivated by calls for educational interventions on misinformation that resonate with diverse communities, the research team created a co-design framework based on an existing misinformation escape room, and facilitated a series of co-design sessions with participants from the two communities. These sessions resulted in two new games featuring entirely new narratives built upon the original game's structure and mechanics. Findings demonstrate the potential of rapid, narrative-focused co-design to engage diverse populations. The study discusses both successes and challenges encountered, offering insights to guide future misinformation game development.

Keywords

Misinformation, Information Literacy, Media Literacy, Escape Rooms, Co-design, Participatory Design

INTRODUCTION

Games have emerged as a popular and promising approach for building resilience to misinformation (Contreras-Espinosa and Eguia-Gomez 2023; Glas et al. 2023; Kiili et al. 2024). Examples include *Breaking Harmony Square*, *Cranky Uncle, Cat Park*, *Go Viral!* and others. While these games are meant to appeal across demographic characteristics, there have been recent calls from educators in schools and libraries for games that attract more diverse communities (Wedlake et al. 2024). Research on misinformation echoes this observation, demonstrating the distinct ways in which misinformation manifests in different communities, for instance, the Black community (Kuo and Marwick 2021; A. Y. Lee et al. 2023), immigrants (Nguyễn et al. 2023), and even popular culture fandom (J. H. Lee et al. 2022).

While the development of new misinformation games tailored to the diverse communities worldwide is appealing in principle, such an endeavor would be prohibitively costly and time-intensive. This study therefore aims to demonstrate an alternative approach: the efficient adaptation of an existing misinformation game to

Proceedings of DiGRA 2025

create contextually relevant versions that resonate with specific communities. Specifically, the study focuses on two strategies for achieving this adaptation: narrative customization and co-design with target communities.

Narrative offers a powerful means for constructing games tailored to diverse communities by considering their specific contexts -- their culture, interests, norms, and other practices (Devasia and Lee 2024). This approach draws on the sociocultural perspective of media and information literacy, which posits that literacy is bound to one's participation in social and material practices (Haider and Sunding 2022). Accordingly, one must study and involve "variously defined groups - such as students, firefighters, immigrants, vault inspectors, or parents" (Haider and Sundin 2022) to reflect different community contexts and norms (Manca et al. 2021). In the context of game design, crafting narratives that resonate with diverse communities allows meaning to be situated within shared worlds of experience—worlds that are inherently collaborative, social, and cultural (Gee 2010).

The second strategy is co-design, a methodology that involves end-users throughout the design process (Walsh et al. 2013). Employing co-design affords game designers the opportunity to reflect the interests and cultural contexts of specific communities. This is particularly salient in the context of misinformation, which spans a wide array of social, cultural, and topical domains. For this project, we selected two very distinct communities: (1) members of ARMY, the fan community of the globally popular Korean music group, BTS, and (2) BIPOC scholars.

Our aim was to enable these two groups of participants with varying levels of game literacy to rapidly develop new narratives that could be seamlessly integrated into the structure and mechanics of an existing game, thereby producing adapted versions tailored to their respective communities. Hence, our research question is: *how can we use co-design to support non-game experts in creating misinformation games by developing new game narratives to reflect the norms and practices of specific communities?* We present our findings in the form of a case study.

LITERATURE REVIEW

Misinformation games

Recent reviews have identified over 40 misinformation games (Contreras-Espinosa and Eguia-Gomez 2023; DeJong 2023; Devasia and Lee 2024; Glas et al. 2023; Kiili et al. 2024). DeJong's (2022) analysis of 33 such games found that the majority (54.5%) are quiz-style and playable in under five minutes—features that would seemingly hinder the integration of meaningful narrative elements. The games are roughly evenly split between real-world and fictional settings. Fictional contexts may offer more favorable conditions for misinformation education, particularly given the ideological and emotional sensitivity of many real-life topics (Wedlake, Coward and Lee 2024).

Despite narrative's potential benefits as a mechanism of engagement, one study found that only 11 of 37 existing misinformation media literacy games qualify as narrative-driven (Devasia and Lee 2024). Furthermore, only two of the narrative games are multiplayer: the *Euphorigen Investigation*, a production of the authors' research team, and *Escape the Fake*. We believe this represents a missed opportunity

for fostering collective sensemaking given the social nature of misinformation (Aghajari et al. 2023; Coward 2023).

Games based on inoculation theory, such as *Get Bad News* and *Breaking Harmony Square*, have been the most studied. Inoculation theory posits that one can receive a weakened dosage of misinformation that builds resistance to future exposures (Cook et al. 2017; Roozenbeek et al. 2022). These games tend to position the player as the bad actor (i.e., spreader of misinformation).

Research on misinformation game design remains limited but is expanding. Two articles relate to escape rooms: one about the user experience and game designers' reflections around *Escape the Fake* (Paraschivoiu et al. 2021), and another study describing a workshop focused on developing information literacy puzzles and research tasks (Pun 2017). Two studies examine the use of co-design to adapt the game, *Cranky Uncle: Vaccine*, for different African countries (Hopkins et al. 2023; Cook et al. 2024). Lastly, Devasia and Lee (2024) propose a framework for developing narrative-based misinformation games.

Narrative

Games with a strong narrative component have demonstrated the potential to influence real-world beliefs and attitudes (Gesser-Edelsburg and Singhal 2013; Green and Brock 2000). In this study, we adopt Chatman's (1978) definition of narrative as a story comprising events, characters, settings, structure, a clear point of view, and a temporal framework. Narratives also serve as exploratory spaces where players can safely take risks (Green 2008)—a particularly valuable feature in the context of misinformation, which often involves politically and emotionally charged content. Fictional settings, in particular, provide a protective distance that enables players to engage with complex issues in a psychologically safe environment.

Communication scholars have theorized why narratives are effective in promoting attitude and behavior change. One key explanation is that narratives reduce resistance to persuasive messaging by altering how individuals cognitively process information (Slater and Rouner 2002). Greater narrative immersion, they argue, is associated with reduced counterarguing. This is especially relevant in misinformation contexts, where efforts to debunk falsehoods can backfire and inadvertently reinforce existing beliefs (Ecker 2017). As a result, misinformation researchers have begun to explore whether narrative immersion can support emotional engagement while minimizing cognitive resistance.

In the realm of educational games, narrative-centered environments have also been shown to enhance both learning outcomes and user enjoyment more effectively than traditional game-based formats (Jackson et al. 2018).

While several narrative-driven misinformation games exist—many of which have been translated or localized for different contexts (Devasia and Lee 2024; Hopkins et al. 2023; Cook et al. 2024)—we found no documented examples, in either practice or scholarship, of developing entirely new narratives within the same game framework. This paper seeks to address that gap. By focusing on the narrative adaptation of existing games, we aim to demonstrate a scalable and effective approach for engaging diverse communities, reducing the need to develop new games from the ground up.

Co-design

Participatory design is an approach that emphasizes the democratization of design through close collaboration between designers and end users (Sanders 2002). Co-design, a subset of participatory design, emphasizes the equitable and equal partnerships between designers and users of technology (Walsh et al. 2013; Yip et al. 2023). Co-design has been used for creating games in a variety of different contexts, for example: *Never Alone*, which was co-designed with Alaska Native people including elders, storytellers, artists, and writers (Pool 2022); *Game of Cruxes*, co-designed with scientists to address scientific concerns about climate change, land use, and socio-economic elements (Salliou et al. 2021); the aforementioned *Cranky Uncle Vaccine* for select African countries (Hopkins et al. 2023; Cook et al. 2024) and; *Starbound Secrets*, co-designed with children to help them explore the feeling of falling down the rabbit hole of misinformation (KidsTeam UW 2024).

The materiality of the tools employed in co-design is widely understood to shape the outcomes of collaborative processes (Bødker et al. 2024). In this study, we utilized a combination of Miro—an online collaborative whiteboard—for the exchange of ideas and visual references, and Google Docs for the collective development and refinement of textual content. Co-design was particularly well-suited to our game design project, as it enabled meaningful engagement with specific communities and facilitated the integration of their interests, cultural norms, and everyday practices—elements central to the sociocultural perspective that underpins our approach.

METHODS

We present this research as a case study—an established qualitative methodology well-suited for conducting "in-depth, multifaceted explorations of complex issues in their real-life settings" (Crowe et al. 2011). Case study research encompasses a range of orientations, differing in their epistemological foundations, defining features, and approaches to data collection and analysis (Yazan 2015). For this study, we adopt a constructivist orientation, which conceptualizes the case study as an "intensive, holistic description and analysis of a bounded phenomenon" (Merriam 1998)—in our case, the co-design process. Within this tradition, Merriam emphasizes interviews, observations, and document analysis as primary data collection methods, which aligns with the sources of data used in our study, as outlined below.

Specifically, this case study examines a co-design project in which we worked with small groups from two distinct communities to develop original narratives intended to replace the storyline of an existing game—*The Euphorigen Investigation*,[1] a misinformation-themed escape room created by the authors' research team. These new versions function as narrative "skins" of the original game: while the underlying mechanics and structure remain intact, the reimagined narratives render the games unrecognizable to players unless they are already familiar with *The Euphorigen Investigation*.

Data collection and analysis

We collected case study data from three sources:

[1] Available at http://www.lokisloop.org

1. Co-design sessions: Recorded and machine transcribed the four co-design sessions.
2. Focus group discussions: Recorded and machine transcribed the two focus group discussions (one for each group).
3. Miro boards: Analyzed the two group's Miro boards that were populated with content (text, images) during the co-design sessions.

We employed reflexive thematic analysis (TA) as our analytical approach. Unlike traditional forms of thematic analysis, reflexive TA is grounded in a constructivist epistemology, positions the researcher as an active and interpretive agent in the analytic process, and allows for greater theoretical flexibility (Braun and Clarke 2006; Braun et al. 2022). This approach is particularly well-suited to our case study, as it supports the exploration of participants' meanings and experiences, acknowledges the research team's embedded role in the co-design process, and facilitates an iterative, dialogic engagement with the data. Reflexive TA enabled us to simultaneously collect, analyze, and reinterpret data in order to refine and deepen our understanding of emerging themes within the evolving context of the co-design activities.

We conducted inductive, open coding of session transcripts and focus group discussions to identify themes related to participants' experiences and perspectives during the co-design process. The first and second author independently coded the transcripts—comprising four sessions per co-design group—and engaged in multiple rounds of discussion to synthesize the codes into themes using a consensus-based approach. In addition, we analyzed the Miro boards with particular attention to how each group engaged with the tool, the types of contributions made, the completeness of each activity, and other emergent patterns or insights. Our analysis was holistic, integrating all data sources while also comparing and contrasting the two co-design processes and evaluating the alignment between intended and observed outcomes.

STUDY DESIGN

Background: The Euphorigen Investigation

To anchor this case study, a summary of *The Euphorigen Investigation*—the original escape room game that served as the foundation for engaging the two co-design groups—is provided.

Escape rooms are live interactive adventure games in which a team of players collaborate to solve puzzles and complete a mission in a set amount of time (typically one hour). The *Euphorigen Investigation* centers on a fictional scenario involving a brain-boosting supplement and the question of adding it to the public water supply. In the game's initial phase, players work through three puzzles that present intentionally ambiguous information about the supplement. This ambiguity, coupled with confirmation bias, often leads players to question the product and suspect underlying corporate malfeasance. At this stage of the game, players uncover a video featuring a prominent scientist who appears to deliver a definitive statement about the supplement. The scientist confirms their suspicions, claiming that the product failed clinical trials. With this apparent evidence, players disseminate the information to the public, enlisting the support of a widely followed social media influencer to amplify the message. At this point players believe they have successfully completed

the game. However, there's a plot twist: the video is revealed to be a deepfake. To mitigate the resulting harm, players must solve an additional puzzle to trace the spread of the manipulated content and distribute the authentic, unaltered video. The game ends with a 15-minute debrief. Game literature shows that the debrief is critical for learning, as it allows individuals to make connections to their real life experiences and behaviors (Schwägele et al. 2021).

Co-design communities

For this project, we collaborated with two distinct communities. The first co-design group comprised members of ARMY, the global fan community of the Korean music group BTS. We selected ARMY due to author Lee's long-standing involvement and familiarity with the community, as well as the recognition that misinformation extends beyond traditionally "serious" topics to include domains such as popular culture. Prior research shows that fan communities develop and share a variety of community-based strategies to counter misinformation (Lee et al. 2022). Lee posted a recruitment message on Twitter (now X) inviting fans to co-create a misinformation-themed escape room. Six individuals were accepted into the project: two librarians, two researchers, one escape room designer, and one student.

The second co-design group consisted of four BIPOC scholars, three of whom identify as Black. Numerous studies have documented the disproportionate targeting of Black communities by misinformation and the distinct ways such content is experienced and resisted (A. Y. Lee et al. 2023; Patterson et al. 2020). With this co-design, we sought to explore how the framework functions when collaborating with individuals with whom the research team does not share a common racial identity, as no members of the core research team identify as Black. To support culturally responsive facilitation, author Coward leveraged his professional network to recruit a co-facilitator external to the research team who could collaborate with author Lee. This led to the involvement of a Black scholar specializing in digital privacy and surveillance, who in turn invited two additional Black scholars and one scholar of color to participate as co-design partners.

In selecting these two communities, we sought to examine how the co-design approach operates across different forms of collective identity. The first was an interest-based community (ARMY), comprising individuals from diverse backgrounds connected by a shared enthusiasm for BTS. The second was a group of scholars that included three Black scholars and one scholar of color from a different racial background. In the former case, the goal was to develop a game tailored to a highly specific and cohesive community, whereas in the latter, the aim was to explore issues relevant to a broader segment of the general population.

The research team played an active role in both co-design processes. We developed a framework to structure the co-design activities, facilitated sessions either independently (for the ARMY group) or in collaboration with a co-facilitator (BIPOC group), and managed the technical and logistical tasks necessary to produce the prototype and final versions of the games. The research team's puzzle designer also participated in both co-designs to support the integration of narrative ideas into the game mechanics. To protect participants' privacy and in accordance with IRB commitments, all names and identifying information have been kept confidential.

Each co-design project consisted of four co-design sessions, interspersed with two backend development phases carried out by the research team (Figure 1). All sessions were conducted via Zoom.

Figure 1: Flowchart representing the co-design sessions in blue, and the backend work carried out by the research team in purple.

FINDINGS

The findings are presented in three sections. The first outlines the co-design framework and sessions, providing both a descriptive account and an assessment of intended versus observed outcomes. The second and third sections offer reflective analyses of the roles played by the research team and the participants, respectively, in the co-design process.

Co-design framework and sessions

We began by developing a co-design framework specifically tailored to creating a new narrative layered onto the structure of the existing misinformation escape room. In doing so, we identified three key goals that the framework needed to achieve:

1. **Establish a shared foundation:** Provide participants with a primer on misinformation to ensure a common language and baseline understanding of key concepts.
2. **Isolate narrative elements:** Deconstruct the original game into its narrative and non-narrative components, allowing participants to focus on reimagining the central storyline while retaining the existing game structure and mechanics.
3. **Facilitate accessible engagement:** Present the co-design activities in a format that is both easy to understand and enjoyable for individuals without prior game design experience.

Session 1: Priming

The first session (2 hours) involved playing the original game, followed by a collaborative brainstorming activity in which participants identified examples of misinformation they had encountered within their specific contexts (e.g., fandom or Black communities).

Playing *the Euphorigen Investigation* was helpful for the participants to absorb the game's learning goals, comprehend the functions of the game's puzzles and events, and develop a thorough understanding of the narrative arc of the game.

For the misinformation brainstorming activity, we drew on Wardle's (2017) taxonomy of seven types of misinformation. The objective was to prompt participants to recall and share a range of real-life examples of misinformation encountered within their respective contexts, and to engage in collective discussion around these instances. Both groups readily identified and discussed relevant examples. Notably, the ARMY participants tended to focus on specific incidents of misinformation, whereas the BIPOC scholars emphasized the individuals or entities responsible for disseminating false or misleading information. Additionally, the BIPOC scholars gravitated toward the 'satire/parody' category within Wardle's framework, which later served as a foundation for their newly developed narrative (Figure 2).

Overall, these priming activities allowed both teams to envision how they might create a new narrative that would appeal to their respective community contexts.

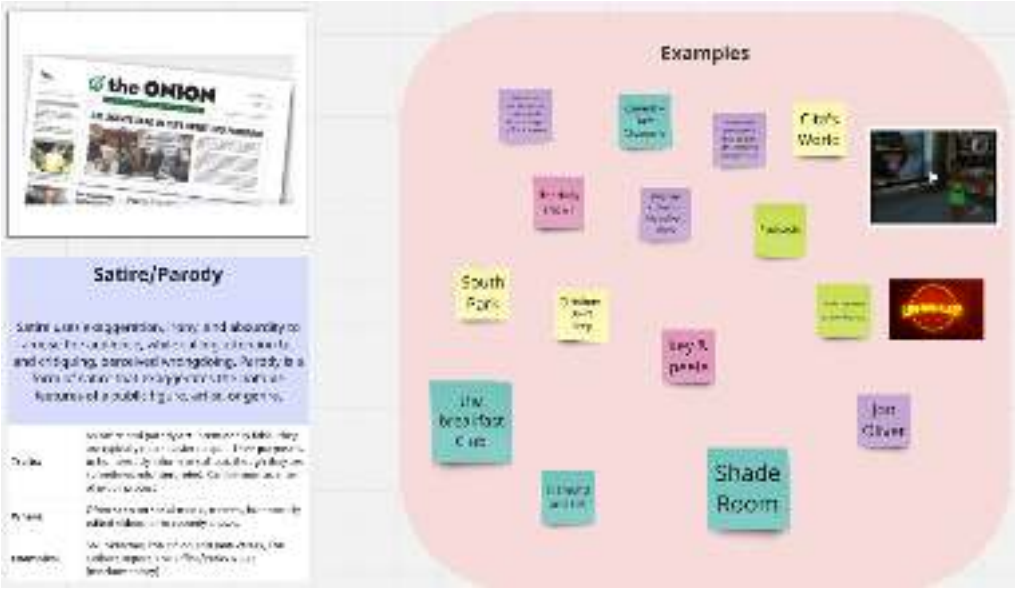

Figure 2: Examples of 'satire/parody' misinformation developed by the BIPOC scholars' co-design group, as documented on the Miro board.

Session 2: Narrative development

The second session (2 hours) focused on the core component of the co-design process: narrative development. Participants engaged in four structured activities designed to parallel the narrative arc of the original game.

First, each team brainstormed *potential entities*--individuals or organizations--that hold power within their respective contexts and generated a list of common negative perceptions associated with those entities (Figure 3).

The ARMY group drew heavily on their shared online experiences within the fandom, with each participant readily recalling examples that were typically familiar to the rest of the group. This collective familiarity facilitated rapid and engaged discussion. For

instance, in response to another comment, one participant noted, *"I think I forgot to bookmark that meme, but it's basically making a joke of how the journalists who spread this information about how ARMYs, as a group, are basically cults...and just focusing on that side instead of being fair and honest about the whole thing that's been happening"* (P1, ARMY, S2). Another participant referenced *"the JTBC incident where media used Big Hit (the entertainment company BTS belongs to, now HYBE)... as a media source and they claimed that Big Hit and BTS' parents were filing a lawsuit against Big Hit"* (P2, ARMY, S2), to which the other participants nodded in agreement, indicating shared recognition and validation of the event.

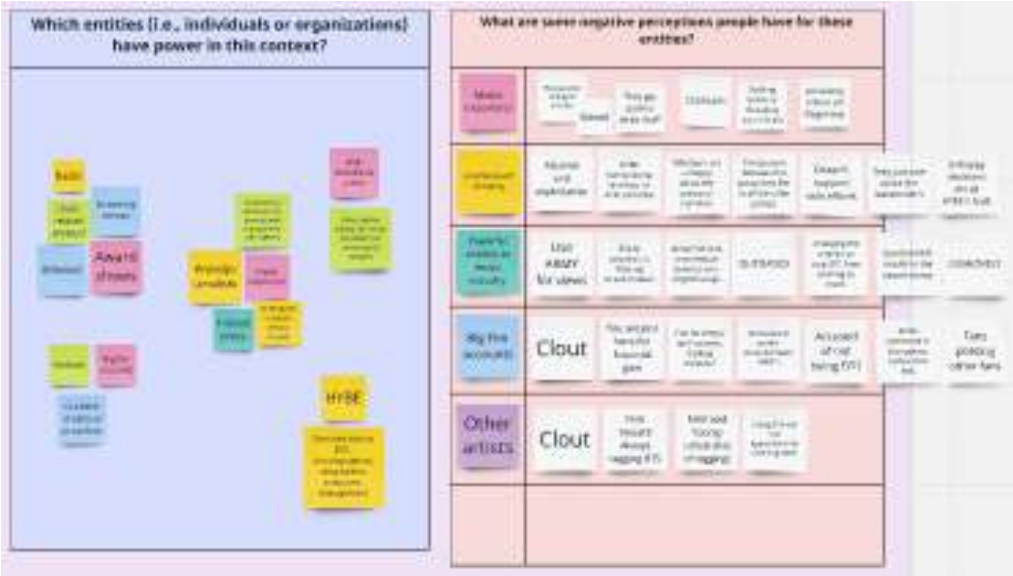

Figure 3: Brainstorming activity by the ARMY co-design team identifying influential entities within the fandom context.

The BIPOC group gravitated toward broader patterns observed on social media, particularly the blurred boundaries between satire, dramatization, and misinformation. In discussing satire, one participant reflected, *"I think Chappelle's Show is probably a good example of, like, good Black satire, and it's great because, like, the story of why he quit. I believe he said, I felt like people are laughing at me and not with me anymore. And so that's part of why he quit"* (P4, BIPOC, S2). In response to a comment about *Key & Peele* (a sketch comedy series), another participant raised a critical question about audience reception: *"I don't know how big their Black audience is. This is the question"* (P3, BIPOC, S2). These reflections highlight the group's interest in how satire operates within racialized contexts and how its reception can shift depending on audience, intent, and platform.

Next, each team selected a single entity to serve as the central protagonist, discussed its narrative potential, identified additional entities to fill supporting roles, and drew on real-life examples as sources of inspiration for narrative development. The BIPOC team created a celebrity persona as their central character:

> *Yeah, we could do [it] like an amalgam. Let's just do celebrity. Because you know, celebrities have so much influence in our lives, and we could just make their personalities be like a mixture of all the big…church preachers, media influencers, hip hop moguls. (P3, BIPOC, S2)*

Third, co-design participants developed the *central conflict or narrative tension* by defining the key action taken by the entity, exploring why this action might provoke skepticism or backlash, and identifying which entity within the story is responsible for spreading the misinformation—along with their motives for doing so.

By this point in the session, both teams had shifted toward more verbal engagement, relying less on the Miro board and instead engaging in collaborative dialogue. Participants actively built on one another's ideas through extended back-and-forth exchanges. For example, one ARMY participant noted, *"Maybe a baby fan follows an account because they like the pictures and suddenly… an event in the fandom happens, and this account they like is tweeting all this narrative"* (P3, ARMY, S2), illustrating the subtle ways misinformation can emerge within familiar social spaces. The BIPOC group exhibited a similar pattern. While working through the central narrative, one participant observed, *"If we're taking Euphorigen as an example, and Coin Hub is the villain… that's flipping how the Euphorigen narrative worked. I think it might be useful to be like, they're trying to sell you coins, right? And then the celebrity is bought into that and then lost their money"* (P4, BIPOC, S2). These moments highlight how both groups used shared references and analogies to creatively reframe the original game with a new narrative.

The final narrative activity in the framework asked each group to identify the type of misinformation (e.g., imposter content, gaslighting, satire) that would best align with their emerging story. However, both groups had already spent the majority of their time engaged in the preceding three activities, which effectively established the core elements of their narratives. As a result, by the time they reached this final task, the appropriate misinformation type had become self-evident, and little additional documentation was produced specifically for this activity. The ARMY group focused on 'manipulated and misleading content,' while, as noted earlier, the BIPOC group had already gravitated toward 'parody/satire' as the central misinformation technique.

Session 3: Puzzle modifications, video scripts, other game elements

Session 3 (3 hours) focused on adapting the game's puzzles and other design elements to align with the newly developed narratives. Two puzzles—one involving misleading headlines and the other featuring manipulated charts—required substantial modifications, with each group generating new headline content as well as revised chart titles and data descriptions (Figure 4). The remaining three puzzles required only minor edits to maintain narrative consistency with the new storylines.

The clarity of the instructions and structure of the tasks enabled both teams to move through this phase of the process with relative ease. Script development for the two in-game videos proceeded efficiently, as did the revision of flavor text, pop-up messages, and other minor game elements to ensure alignment with the new narratives.

Figure 4: The BIPOC group using a Miro board to revise chart content from the original game, adapting it to fit their newly developed narrative.

Session 4: Testing, feedback & focus group discussion

The final co-design session (2 hours) was dedicated to playtesting the game prototype, offering final change requests, and participating in a focus group discussion. In preparation for this session, the research team developed a working prototype based on the content generated in the Miro boards and insights from the previous co-design sessions.

Participants across both groups expressed strong enthusiasm for the game prototypes. In the ARMY group, one participant exclaimed, *"It looks amazing"* (P4, ARMY, S4), followed by another's affirmation: *"Yeah, it looks real"* (P1, ARMY, S4). A third participant praised a specific design element: *"I like how clear it was when we do the deepfake part. It was very clear that this is a different person messaging you at first"* (P3, ARMY, S4). Similarly, members of the BIPOC group responded positively. One participant noted, *"What's great about it is that it's got that aesthetic, which is like slightly old school, but, you know, it has that slightly different shine of bitcoin which I like—cool"* (P4, BIPOC, S4). These reactions highlight the perceived effectiveness of both the visual design and the integration of the new narratives into the games.

This enthusiasm was echoed in the focus group discussions. One ARMY participant remarked, *"I was excited because it looks like what we have been sharing since the very beginning of our group sessions"* (P1, ARMY, FGD). Another added, *"It's very realistic, I feel like, and that's really nice. I feel other fans would relate to this and read the text messages and feel happy, I hope"* (P2, ARMY, FGD), highlighting the perceived authenticity and emotional resonance of the game. A participant from the BIPOC

group emphasized the game's potential for classroom use: *"We're always trying to find something interesting for students to do in class time, and I think something like this would be really fun for them"* (P4, BIPOC, FGD). Another noted the game's capacity to foster intergenerational dialogue: *"The example that we used, you know, might resonate specifically with some people more than others, but I like the idea of talking to a different generation about something they experienced online"* (P1, BIPOC, FGD). These reflections suggest the prototype was not only well received but also viewed as appealing for broader social or educational engagement.

Both groups also provided constructive feedback and suggestions for refinement. For example, one ARMY participant proposed an alternative ending that would offer a clearer takeaway for players, drawing on established practices within the fandom: *"So you know how, like, the Black Swan and ARMY crisis management and all those protect accounts, they make these threads for baby ARMYs—'don't do blah blah blah'—so it could be something like that, a lesson-learned type of thing also. So that there's a takeaway"* (P2, ARMY, S4). The BIPOC group engaged in similar discussions. One participant suggested a culturally resonant revision to the deepfake video script, offering a well-known quote as a replacement for a more generic line: *"I think maybe, instead of 'you must conduct your own research,' I would quote Kanye—'You need to do the education'"* (P2, BIPOC, S4). These suggestions reflect participants' attention to tone, audience, and cultural relevance in the final design.

Each co-design process culminated in the development of a new game, detailed in the *Outcomes* section below.

Reflections on role of research team

Highly structured framework provided proper scaffolding

Several participants noted that the overall structure of the co-design process instilled confidence in the project and offered sufficient scaffolding to support their engagement with the individual activities. The framework itself was highly structured and tailored to the original game that served as the foundation for the co-design. Each activity was broken down into manageable tasks, accompanied by clear instructions, suggested time allocations, and illustrative examples to guide participants through the process.

> *Because of the Miro board, because we have the structure, when we begin each group session I could see 'oh, there's the placeholders of what we're going to talk about today', and so I think that helps for me to have that confidence that we're going to do something in a structured way and I trust the process because of that. (P1, ARMY, FGD)*

> *At the beginning, I was very happy to see [it] all laid out in that Miro board, so I could have that trust that oh it's all planned out and we're gonna have reached the point this way, using the workflow, and I think that's key. (P1, ARMY, FGD)*

Indeed, the visual structure of the Miro board played a crucial role in shaping participants' experiences. Across both focus groups, participants initially expressed concern about the scope and complexity of redesigning a game to reflect their respective communities. However, encountering the pre-structured Miro board at the

outset of the design session provided a sense of reassurance. The clear layout and predefined activities helped demystify the process and offered a tangible starting point, easing participants into the collaborative work.

> *Jinha [author] at the beginning of the meeting would say, okay here's what we're doing today, and with the Miro board we can physically see, here's what we're doing. And so just having expectations of what these two hours or three hours will look like from onset helps a lot. So I'm like, okay this is not so like oh God, what are they gonna ask of me, am I going to be able to do this? It's like, no, I'm going to be guided through this process and it's something that I can participate in and to me it made it less intimidating. (P3, ARMY, FGD)*

By the same token, lack of familiarity with the Miro board application as a tool was a source of discomfort for others.

> *I think my lack of familiarity with the Miro board played a factor, I think, because I know a lot of like designer people who use it, and you know, [names of other co-design team members] seemed very comfortable with it, and I was just like what's the sticky note? How do I type into it? So in that sense it felt a little like I had to think about stuff while also trying to figure out the Miro board stuff. (P4, BIPOC, FGD)*

Active facilitation was critical

The research team played a highly active role in facilitating both co-design processes. One indicator of this involvement is speaking time, which we calculated for Sessions 2 and 3—sessions dedicated to narrative development and puzzle adaptation (Sessions 1 and 4 were excluded, as they focused on gameplay, orientation and testing/focus group discussions, respectively). In the ARMY co-design, the research team (facilitator and game designer) accounted for 125 minutes of speaking time, compared to 71 minutes by participants. In contrast, the BIPOC co-design showed a reversed pattern: the research team spoke for 41 minutes, while participants spoke for 115 minutes. This shift reflects the effectiveness of involving an external co-facilitator in the second co-design, as intended. Nevertheless, in both cases, the data underscore that the active engagement of the research team was essential to guide the process and support participants throughout the activities.

This pattern is also evident qualitatively, with notable differences in the facilitator's role across groups. In the ARMY co-design, the research team facilitator not only guided the process but also made substantial contributions to the content and discussions:

> *One thing that I want to share is this account that I actually really enjoy, the btschickendata account, which I think is great, where I think she has a whole BTS discography that is based on her 'bock-ing' [making chicken noises] to the songs. And then she has a lot of these chicken-related jokes, so that's an account that I really like as a parody account. (Research team facilitator, ARMY S2)*

In the BIPOC co-design, facilitation roles were divided: the research team co-facilitator managed the overall co-design process, while the BIPOC scholar co-facilitator led the

substantive discussions. Reflecting on their role, the scholar expressed some uncertainty about meeting expectations, noting, *"I did feel a little bad, because, I think maybe they (the co-facilitator and the game designer from the research team) were anticipating stepping back a little bit more"* (P, BIPOC, S3).

Reflections on role of participants

Inclusive co-design process generated pride and self-efficacy

Participants praised the co-design approach for its inclusivity and collaborative nature. As one ARMY participant reflected, *"I felt included and my opinion was asked for, and I could see those reflected in the end results as well"* (P1, ARMY, FGD). Enthusiasm for the final games was evident in both groups. ARMY participants expressed eagerness to share the game with fellow fans, while the BIPOC group envisioned using the game within academic settings, libraries, and as a tool to facilitate intergenerational discussions on misinformation.

Participants also reflected on how the co-design process deepened their understanding of misinformation's spread within online ecosystems. One ARMY participant remarked, *"I know information spreads quickly online, but just to think about the extent of how much damage can actually be done with just one retweet was certainly a lesson for me"* (P5, ARMY, FGD). Another added, *"There was an activity where we had to lay out all the different actors, so that made me think of the ecosystem—like it's not just one tweet, it's everything: the media, somebody else who picks it up, somebody who is a manager or insider from the community, etc."* (P2, ARMY, FGD). Participants in the BIPOC group similarly reflected on the insights gained through the game experience, underscoring the value of the co-design process in fostering critical awareness.

> *One of the things to me it highlights is, like, how utterly impossible it's getting now you know. We were looking at the AI images, right, and they are improving right. And how much work it is, you know, just to keep up. I mean like it's kind of my job to keep track of some of this stuff, and you know, people who don't have that luxury like, it's really kind of impossible right? It just kind of reaffirmed that for me. (P1, BIPOC, FGD)*

Shared experiences and language fostered team cohesion

Participants in both focus groups emphasized the importance of a shared lexicon and collective experiences in shaping how they engage with misinformation. One ARMY participant described this as the *"key to how we could actually work together"* (P1, ARMY, FGD), while another reflected on leveraging their fandom experience to critically assess misinformation: *"I was able to use [my] experience as a part of a fandom to see all of the things [I] look at every day and think about misinformation that way"* (P4, ARMY, FGD). Although the BIPOC group's shared experiences were less cohesive, they echoed this sentiment amidst extensive discussions about how different segments of the Black community might interpret the game. One participant noted, *"We are all from different places, and when we're having these conversations and using the Miro board…it was a discussion of, 'Would [players] say this?' 'What will [players] understand?' and those things actually did come up while we were doing this"* (P2, BIPOC, FGD). Despite acknowledging that *"the Black community is incredibly*

diverse," this participant affirmed the existence of a *"shared lexicon across different groups"* and believed that the group *"walked that line pretty well"* throughout the process (P2, BIPOC, FGD).

Outcomes

Below, we describe the final products of the co-design sessions, focusing on the new narratives. As illustrated below, the narrative arcs of both new games closely parallel that of the original game.

Galaxy

Galaxy centers on a fictional K-pop group, Planet5. Before entering the game, players read the mission statement (Figure 5), which situates them in the role of a new fan navigating challenges within their fandom community.

Figure 5: Mission statement for Galaxy

The game begins with players entering a room (Figure 6) and opening a message from a fellow fan (Figure 7).

Figure 6: Opening image for *Galaxy*

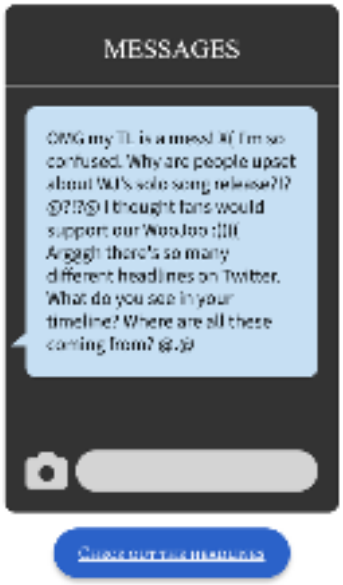

Figure 7: Message from fellow fan.

This narrative positions players as fellow 'stans'—fans with a particular admiration for a specific celebrity—of WooJoo (WJ), a member of PLANET5. Rumors swirl within the fandom about WJ's decision to release a solo song and the possibility that he might leave the band. After successfully solving the first three puzzles, players encounter a video in which WJ alleges mistreatment by PLANET5's management and announces plans for a solo tour (Figure 8).

Figure 8: A video featuring WJ, a member of PLANET5, in which he alleges mistreatment by the management company. This video is later revealed to be a deepfake.

Players then discover that the video is a fan-made deepfake, deliberately created to provoke controversy and incite anger toward WJ within the fandom. To counteract the misinformation, players must solve additional puzzles that uncover the authentic video, where WJ expresses his happiness as a member of PLANET5 and his excitement for their upcoming tour together.

Bo$$BabyKoin

Bo$$BabyKoin is the fictional story of a digital currency, a celebrity endorsing it, and the dilemma of whether to encourage one's parents to invest their life savings. Players begin by reading the mission statement (Figure 9).

Figure 9: Mission statement for *Bo$$BabyKoin*

The game begins with players entering a room (Figure 10) and opening a message from a friend thanking them for assisting with investigating *Bo$$BabyKoin*.

Figure 10: Opening image for *Bo$$BabyKoin*

Players progress through a series of puzzles that present a conflicted view of the digital currency's legitimacy. Ultimately, they unlock a video featuring the celebrity endorser, who asserts the currency's authenticity (see Figure 11).

Figure 11: The celebrity, Galen Terry, appearing to endorse Bo$$BabyKoin

However, the clip is misleading, as it omits the concluding segment where the celebrity reveals that the endorsement is a joke. In the complete video, the celebrity clarifies that he is not a financial advisor and advises viewers to make their own informed decisions.

DISCUSSION

Overall, both teams successfully completed the co-design activities within the allotted time (under 10 hours), rapidly generating the content necessary to develop their respective games. Notable differences emerged between the two groups. For the ARMY group, the focus was clearly defined from the outset: addressing misinformation within their specific fandom community. Their shared cultural framework, collective knowledge, and deep familiarity with the subject matter fostered a goal-oriented approach, enabling the team to work efficiently through the framework's tasks. Interactions were infused with their enthusiasm for fan culture and drew extensively on personal experiences within the fandom.

In contrast, the BIPOC group concentrated on broader cultural and societal narratives related to misinformation and its impact on the Black community. Drawing from examples in mass media and historical events, they engaged in in-depth discussions and critical analysis. Their deliberations were often exploratory, necessitating additional time to synthesize diverse perspectives into a coherent and nuanced narrative that addressed the complexity and layered nature of the topic.

We also observed common challenges across both groups. Although both teams ultimately succeeded in creating new narratives, the four activities comprising this component (Session 2) exhibited varying levels of effectiveness. Notably, the research team facilitator assumed a more active role than initially anticipated, particularly in helping to integrate disparate narrative elements into a cohesive storyline. Based on

these observations, we conclude that this aspect of the co-design process requires further development. We have since taken steps to strengthen this component of the framework by more explicitly defining key features of the narrative development process (Devasia and Lee 2024).

For game designers, the effort involved in developing a co-design framework and facilitating co-design sessions is minimal compared to the demands of designing a new game from the ground up. In creating the framework, we reverse-engineered the original game by abstracting and isolating its narrative components from the puzzles and other non-narrative elements. The co-design sessions required less than 10 hours of participants' time, and the process was conducted with teams of four and five participants—numbers that proved highly manageable for effective collaboration.

While we present a relatively flexible process for adapting games through co-design, further research is needed to evaluate the efficiency of these co-designed games when deployed to their intended audiences. Preliminary results from our study (Devasia et al. 2025) comparing the original *Euphorigen Investigation* with the co-designed *Galaxy* showed that participants who identified as part of any fandom (not limited to K-pop) perceived both *Galaxy* and *Euphorigen Investigation* as engaging and narratively relevant. However, participants who did not identify as part of a fandom found *Galaxy* to be extremely unrelatable, underscoring the success of the co-design group in tailoring the game to their specific community. Moreover, for fan participants, playing *Galaxy* was highly effective in shaping post-game conversations about their personal experiences with misinformation, as they were able to better connect the game's content to everyday examples. These results build on previous research which suggests that the specificity of the co-designed artifact--and the community responsible for its creation--plays a critical role in enhancing player engagement and perceived narrative relevance (Williams 2018).

We are currently extending this work to diverse cultural contexts worldwide—including Belgium, Czechia, Denmark, the Netherlands, Poland, Slovenia, Ghana, and Turkey—where we are systematically documenting the co-design processes and, in some cases, evaluating player outcomes.

LIMITATIONS

This case study has several limitations. Consistent with the nature of the case study methodology, we do not claim generalizability; the findings are specific to the two co-design projects examined. We also acknowledge the influence of our own biases as researchers, shaped by our epistemological orientations, values, and experiences. As active participants in the case study, this is especially salient. However, we contend that this positionality also constitutes a strength, enabling us to provide a nuanced and well-informed analysis.

Additionally, although we conducted a study comparing narrative appeal of *Galaxy* versus *Euphorigen Investigation*, we have not studied the co-designed games' effectiveness in enhancing resilience to misinformation—an important question that remains for future research.

CONCLUSION

This case study demonstrates the application of co-design to develop two new games, each featuring entirely original narratives constructed upon the underlying structure and mechanics of an existing misinformation escape room. The research team engaged two distinct groups of non-expert game designers—from the ARMY fandom and a group of BIPOC scholars—in a series of co-design sessions, resulting in the creation of two new games: *Galaxy* and *Bo$$BabyKoin*, respectively.

With a tailored framework and experienced facilitation, we have demonstrated that it is feasible to convene a small group (e.g., 4–6 members of a specific community) and, within approximately 10 hours, collaboratively produce a new misinformation game. This capacity for rapid game development tailored to diverse communities represents a potentially significant advancement in scalability and outreach.

The case study also highlights several opportunities for future research and development. The framework proved more effective for a specific, cohesive community—the ARMY fandom—than for a broader subset of the general population represented by the Black community. This suggests that adaptations may be needed to help larger, more diverse groups efficiently identify and coalesce around a focused narrative theme. Additionally, given the study's exclusive focus on the escape room genre, further investigation is necessary to explore how this co-design approach can be adapted to other narrative-driven game genres. The findings also underscore the importance of active involvement by the original game development team throughout the co-design process. Expanding the framework to enable independent use by external facilitators could open new possibilities for creating games tailored to an even wider array of communities. Finally, additional research is essential to assess how co-designed games are received by their target audiences and to evaluate their impact on misinformation resilience.

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