

Gaming Against Deception

Leveraging Interactive Media to Build Digital Resilience in the Age of Disinformation

Sonja Gabriel

Disinformation has long challenged public discourse, and the digital age has amplified its rapid dissemination. This paper explores how digital serious games can serve as proactive prebunking interventions, building digital resilience through interactive media. Drawing on inoculation theory, the analysis examines four games—Bad News, Harmony Square, Cranky Uncle, and Go Viral!—which expose players to weakened doses of disinformation tactics such as emotional manipulation, conspiracy theorizing, and polarization. Through role-playing and strategic decision-making, these games encourage the development of counterarguments and critical thinking skills that can mitigate the persuasive impact of fake news in real-world settings. The theoretical analysis identifies both strengths and limitations: while digital games offer engaging, immersive learning experiences that enhance media literacy, challenges remain in ensuring long-term retention of skills and in integrating these tools into formal educational curricula. The paper concludes by emphasizing the need for further research and the critical role of teacher guidance in complementing game-based interventions to achieve sustained resistance against misinformation.

Keywords: Inoculation Theory, Serious Games, Misinformation, Information Literacy, Prebunking

Paper DOI: <https://doi.org/10.48341/a5gy-vv92>

Introduction

Disinformation is not a modern invention; false narratives have long been woven into the fabric of public discourse. For instance, shortly after Mark Twain's death in 1910, spurious claims emerged suggesting that the famed author had orchestrated his own demise as a final satirical act critiquing society's morbid fascination with death. Although later debunked by literary historians (Barth & Homberg, 2018), this early example of misinformation reveals how even revered cultural icons can become the subjects of distorted narratives.

Another striking example is the Great Moon Hoax of 1835, when The New York Sun published a series of articles falsely claiming the discovery of exotic lunar life forms. This sensational fabrication captivated a broad readership and underscored how the allure of mystery could override critical skepticism (Lackovic, 2021). This historical evolution from sensational print hoaxes to the rapid, global spread of digital misinformation underscores the urgent need for innovative strategies, such as serious games, to cultivate critical thinking and digital resilience in today's media landscape. Equally notorious is the early twentieth-century circulation of the "Protocols of the Elders of Zion," a fabricated document that falsely purported to expose a secret Jewish conspiracy for global domination. Despite being thoroughly debunked by scholars, this text has had a long-lasting impact on anti-Semitic rhetoric and conspiracy theories (Hasian, 1997).

These historical instances underscore that while the media landscape has radically transformed with the advent of digital technologies, the fundamental challenge of disinformation remains. Digitalization made it even easier to spread disinformation, there are fake news websites pretending to publish actual news, manipulated statistics and graphics as well as deepfakes (videos or audio recordings having been altered by using artificial intelligence to make it appear as though a person said or did something they never did). According to worldmetrics.org (2025) 70% of US-Americans have encountered false or misleading news online and fake news stories are 70% more likely to be shared than true stories via social media. 88% of Europeans are concerned about fake news and online manipulation (European Commission, 2025). Today, rapid information dissemination—especially during global crises such as wars, pandemics, and climate change—calls for innovative strategies to build digital resilience. This paper explores the potential of digital serious games as educational tools designed to counteract misinformation and foster critical thinking. By providing interactive, feedback-rich environments that simulate the dynamics of social media and information spread, these games offer promising avenues for enhancing media literacy and preparing individuals to navigate the complex information landscape of the digital age.

Fake News is a misleading term

The term "fake news" gained widespread popularity during the 2016 US presidential election, when it was frequently used to describe deliberately fabricated stories designed to influence public opinion. However, the concept has historical precedents dating back to the early 20th century, when it was occasionally used to describe propaganda and yellow journalism. Despite this long history, "fake news" is misleading because it lumps together a wide range of media content—from completely fabricated stories to biased reporting or even satire—without distinguishing between intent, context, or quality (Geifert, 2018). This oversimplification can obscure important nuances, such as the difference between deliberate disinformation and honest mistakes or editorial slants. Moreover, "fake news" has been co-opted as a political weapon to dismiss and delegitimize news that challenges certain viewpoints, thereby undermining trust in genuine journalism (Krishnamurthi et al., 2024).

In today's digital landscape, understanding the nuanced intentions between different types of content is critical for developing effective strategies to combat the spread of false or harmful narratives. As figure 1 shows there are different terms that need to be defined and differentiated depending on how much knowledge or belief they contain and how they move along the spectrum between true and false. This leads to four different categories of information: disinformation, mal-information, misinformation and accurate information.

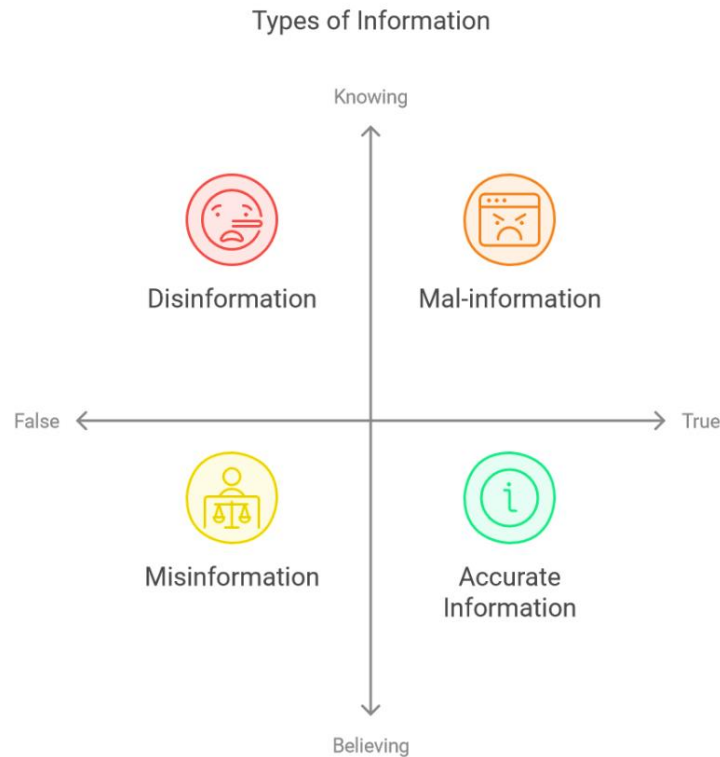


Figure 1. Types of Information

Accurate information refers to data that is accurate, verifiable, and presented without bias. It forms the foundation of knowledge and decision-making. For example, a government report on national economic performance that is based on reliable statistics exemplifies quality information.

Misinformation is false or inaccurate information that is spread without the intent to deceive. Often, it arises from misinterpretation or unintentional mistakes. An example of misinformation is the circulation of incorrect details about a public health issue—such as erroneous statistics about vaccine efficacy—shared by individuals who believe the information to be true.

Disinformation is deliberately false information that is created and disseminated with the intention to mislead or manipulate public opinion. A modern example of disinformation is the organized spread of conspiracy theories regarding the origins of COVID-19. Certain groups and state-sponsored actors have intentionally circulated false narratives to undermine trust in scientific institutions and public health measures, thereby exacerbating societal divisions and hindering effective responses to the pandemic.

Mal-information involves the use of genuine information shared with malicious intent, typically to cause harm or damage reputations. It often includes the selective presentation or manipulation of factual data. For instance, the intentional release of private emails or sensitive documents with the aim of discrediting a public figure constitutes malinformation, as the underlying information is true but its dissemination is designed to inflict reputational damage.

Generative AI has added a new dimension to the disinformation landscape by making it much easier to produce highly realistic, yet completely fabricated content. Advanced algorithms can now generate convincing images, videos, and text that closely mimic real media, blurring the line between fact and fiction. This capability has increased the risk of large-scale manipulation, as malicious actors can use these tools to create content that appears credible and authoritative. The rapid spread of such disinformation not only undermines trust in traditional media and public institutions, but also complicates efforts to verify authenticity, leading to a more volatile information ecosystem.

In addition, the proliferation of generative AI technologies poses unique challenges for regulatory frameworks and media literacy initiatives. As these tools become more accessible, the potential for widespread misuse grows, requiring a coordinated response from policymakers, technology developers, and educational institutions. Strategies to mitigate these risks include developing robust detection algorithms to identify AI-generated content and implementing transparency measures that require clear labeling of synthesized media. By proactively addressing these issues, society can better guard against the erosion of trust and ensure that the benefits of generative AI are realized without compromising the integrity of public discourse.

Differentiating between disinformation, mal-information, and misinformation is crucial because each type presents unique challenges and requires tailored responses. Disinformation, being deliberately false information designed to deceive, calls for strategic countermeasures such as fact-checking and exposure of underlying agendas. In contrast, misinformation—false information shared without harmful intent—often stems from misunderstandings that can be addressed through corrective education and media literacy. Mal-information, which involves the deliberate misuse of truthful information to cause harm, necessitates a nuanced approach that balances transparency with ethical considerations. Recognizing these distinctions enables policymakers, educators, and technology developers to design more effective interventions, ensuring that resources are allocated appropriately and that strategies are finely tuned to the specific nature of the information being countered.

How to fight disinformation

Media literacy is broadly defined as the ability to access, analyze, evaluate, and create media messages across a range of contexts and formats. This competency enables individuals not only to consume media critically but also to understand the construction and underlying intentions of media content, thereby fostering more informed and engaged participation in society. As Buckingham (2009) states, however, there is not a common understanding of the term media literacy:

Media literacy, it seems, is a skill or a form of competency; but it is also about critical thinking, and about cultural dispositions or tastes. It is about old media and new media, about books and mobile phones. It is for young and old, for teachers and parents, for people who work in the media industries and for NGOs. It happens in schools and in homes, and indeed in the media themselves. It is an initiative coming from the top down, but also from the bottom up. (Buckingham, 2009, p. 4)

Jones-Jang et al. (2021) found out that people showing greater literacy (not only media literacy but also information, news and digital literacy) achieved higher scores when it came to identifying fake news but the literacy that helps most is information literacy, a term that is defined as a set of abilities requiring individuals to “recognize when information is needed and

have the ability to locate, evaluate, and use effectively the needed information” by the American Library Association (1989). Like with other literacies as well, there are several different definitions of information literacy (Wuyckens et al., 2022). Thus, the question arises how to fight disinformation and how to raise awareness to this topic.

Debunking vs. Prebunking

In the context of combating disinformation, two key strategies have emerged as effective countermeasures: debunking and prebunking. Both approaches aim to protect the public from the harmful effects of false narratives, yet they operate at different stages of the misinformation lifecycle.

Debunking refers to the reactive process of correcting false information after it has been disseminated. This strategy involves identifying inaccuracies, providing factual corrections, and explaining the context that led to the spread of misinformation. For example, fact-checking organizations that publish detailed reports to refute claims about electoral fraud after an election are engaging in debunking. Research has shown that while debunking can mitigate the influence of misinformation, its effectiveness may be limited by cognitive biases and the persistence of initial false beliefs (Kvetanova et al., 2021).

Prebunking, grounded in inoculation theory (cf. Figure 2), is a proactive strategy designed to build resistance against disinformation before it takes hold. Inoculation theory, originally developed in the context of persuasion research, posits that individuals can be "inoculated" against future persuasive attacks by being exposed to a weakened version of an argument along with refutations or counterarguments. Essentially, much like how a vaccine introduces a harmless form of a virus to stimulate immune response, prebunking exposes people to a diluted dose of misinformation along with factual corrections. This process helps individuals recognize the tactics used in misleading messages and develop a critical mindset that can defend against more potent, subsequent disinformation (Lewandowsky & van der Linden, 2021; van der Linden, 2022).

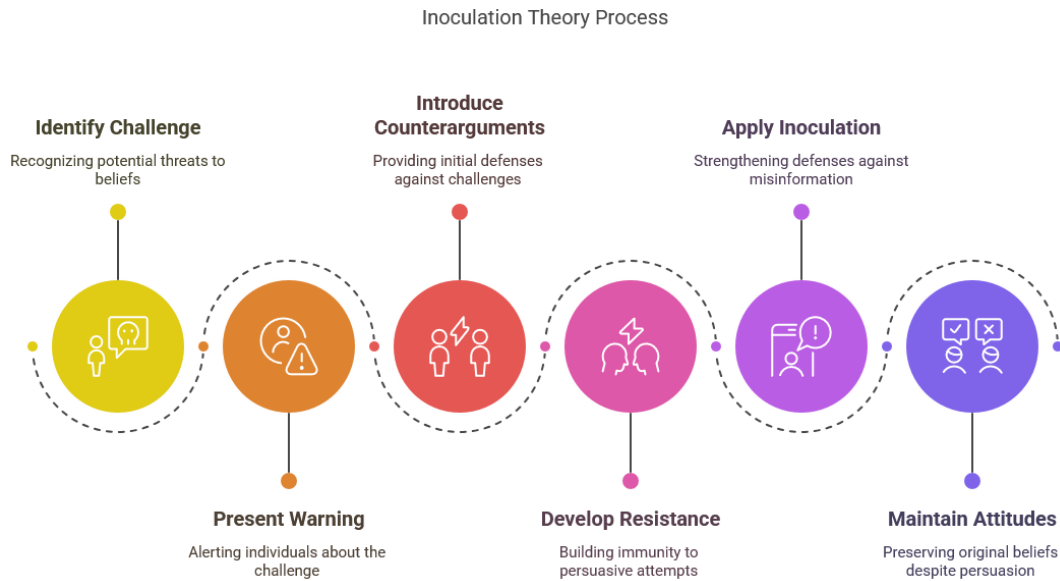


Figure 2. Inoculation Theory

For example, during the COVID-19 pandemic, prebunking initiatives included public service announcements and educational campaigns that presented common myths about the virus—such as exaggerated claims about miracle cures—paired with scientifically backed counterarguments. By confronting these weak forms of misinformation early, these campaigns effectively reduced the likelihood that individuals would be swayed by more sophisticated disinformation later on. Van der Linden et al. (2022) proved the effect of inoculation theory by developing five short videos that should inoculate people against manipulation techniques which are commonly used in des- and misinformation. In a large scale study they found out that people who watched these videos were more likely to recognize these techniques and were better at separating trustworthy from untrustworthy messages on social media.

As Tay et al. (2024) state prebunking is more effective than debunking because it proactively prepares individuals to recognize and resist misinformation before they encounter it. In the study, prebunking demonstrated significant protective effects against novel misinformation on both cognitive measures and behavioral outcomes immediately after the intervention. In contrast, debunking only showed statistically significant effects on cognitive measures and was ineffective after a one-week delay. This suggests that prebunking equips individuals with the necessary skills to critically evaluate information before it influences their beliefs. Similar results are confirmed by the systematic scoping review by Ma & Ma (2025) as it indicates that narratives used as prebunking strategies can prepare individuals to critically evaluate misleading information, thereby reducing its impact. In contrast, debunking often occurs after misinformation has been encountered, which may not effectively change pre-existing beliefs. The emotional appeals and audiovisual elements in narratives can further enhance the effectiveness of prebunking strategies.

The Role of Digital Games

Digital games have emerged as a promising tool in the fight against misinformation, offering innovative ways to engage users in prebunking strategies. By leveraging interactive and

immersive environments, digital games can simulate the dynamics of information spread and provide players with firsthand experience in identifying and countering false narratives before they take hold. These game-based interventions not only entertain but also educate, creating opportunities for players to experiment with critical thinking and develop the resilience needed to navigate complex media landscapes. In doing so, digital games serve as both an educational resource and a form of psychological inoculation, equipping individuals with the cognitive tools necessary to discern and reject misleading content. However, as Schrier (2021) states game design plays a role as well. Games providing scaffolded and meaningful choices lead to a better and more intense player engagement.

Furthermore, digital games allow for the safe exploration of contentious topics, enabling users to confront misinformation in a controlled environment without the risk of real-world consequences. This interactive form of learning encourages active participation, making it easier for players to internalize the strategies needed for effective prebunking. As players progress through game scenarios that mimic real-life information challenges, they not only learn to recognize common manipulation tactics but also practice counteracting them in real time. This dual approach—blending education with experiential learning—highlights the transformative potential of digital games in building digital resilience and fostering a more informed and discerning public. Basol et al. (2020) effectively demonstrated in their study that an online fake news game can serve as a robust broad-spectrum inoculation against misinformation. The systematic literature review by Killi et al. (2024) analyzed 15 papers and found that game-based interventions have shown promising results in mitigating the effects of misinformation, particularly focusing on fake news and critical reading skills. All reviewed papers reported positive outcomes from the use of games in this educational context.

However, despite their promise, digital games as prebunking interventions are not without their limitations. Critics argue that while games can captivate audiences and simplify complex issues, they may also oversimplify the multifaceted nature of misinformation, reducing nuanced debates to binary scenarios that do not fully reflect real-world challenges. Pimmer et al. (2020) researched the effects of two popular online fake news games with university students. Results show that there was only a slight increase in news classification abilities with one game and no change with the other game. Moreover, the immersive and entertaining nature of gameplay can sometimes lead to cognitive overload, where the excitement of the game detracts from the retention of critical counter-strategies. There is also the concern that such interventions may only appeal to specific demographics—primarily those who are already digitally literate—thus excluding other segments of the population who are equally vulnerable to misinformation. Finally, the long-term impact of game-based prebunking remains uncertain, with questions about whether the skills and awareness gained through these experiences translate into sustained resistance against disinformation in everyday contexts.

Serious Games to Combat Fake News

Serious games have emerged as an innovative strategy in the fight against fake news by immersing players in interactive scenarios that simulate the persuasive tactics of disinformation campaigns. In these digital interventions, users encounter diluted versions of misleading techniques—such as emotional manipulation, polarizing narratives, and the use of fake experts—which enable them to build cognitive defenses against more potent misinformation in real life. Each game presents a controlled environment where active participation in counteracting deceptive content transforms abstract principles into practical skills. The next

section introduces four serious games that apply key aspects of inoculation theory, outlining how their design elements contribute to developing digital resilience against fake news.

In order to explore the potential of digital serious games for countering misinformation, an analytical framework based on inoculation theory was applied to four selected games. The selection criteria focused on the diversity of disinformation tactics addressed by each game—such as emotional manipulation, conspiracy theorizing, and polarization—as well as the extent to which each game integrates active inoculation strategies and clearly defined educational objectives. Bad News, Harmony Square, Cranky Uncle, and Go Viral! were chosen because each represents a unique approach to exposing players to weakened doses of misleading information. Their evaluation is based on a theoretical analysis of game mechanics and design elements, examining how effectively each game fosters interactive experiences that encourage the development of counterarguments and critical thinking skills. This analytical approach highlights both the strengths and limitations of these digital interventions in building digital resilience against fake news.

Bad News

Bad News (<https://www.getbadnews.com/en>) is a browser-based serious game in which players assume the role of a fake news producer. In doing so, they learn about—and actively experiment with—the very techniques that real-life purveyors of misinformation use. The gameplay is structured around several levels (often represented as “badges”), each of which introduces a specific manipulation tactic such as:

- Impersonation: Mimicking credible sources or trusted public figures.
- Emotional manipulation: Crafting messages that use strong emotional appeals (e.g., fear, anger) to capture attention.
- Polarization: Exacerbating divisions by framing issues in an “us versus them” narrative.
- Conspiracy theorizing: Weaving speculative or conspiratorial explanations.
- Discrediting opponents: Attacking or undermining the credibility of trusted sources.
- Trolling: Using provocative or misleading statements to incite reactions.

Throughout the game, players make choices that determine how many “followers” they gain and how much “credibility” they maintain. Choosing strategies that are too overt can hurt credibility, while subtler manipulations help to build a following—mirroring the delicate balancing act of real-world misinformation campaigns.

This design directly implements the principles of inoculation theory. Inoculation theory holds that exposing people to weakened versions of persuasive arguments (or, in this case, misinformation techniques) can “vaccinate” them against future, more potent attempts at persuasion. By actively engaging in the production of fake news, players not only learn to recognize these techniques in real life but also build “mental antibodies” that make them more resistant to misinformation when they encounter it online.

Experiments carried out by Leder et al. (2024) demonstrated that providing different types of feedback after playing the “Bad News” game significantly improved participants’ ability to accurately identify both misinformation and real news one week after gameplay, resulting in better discernment compared to a control group that did not receive feedback. Trabert et al. (2024) used Bad News as a gamified inoculation intervention and found out that the game significantly reduces susceptibility to misinformation from both political ingroup and outgroup

publishers, indicating that these interventions can effectively enhance veracity discernment among news consumers, regardless of the source's political alignment.

Harmony Square

Harmony Square (<https://harmonysquare.game/>) is a free-to-play browser game designed to “inoculate” players against political misinformation. In the game, players take on the role of the Chief Disinformation Officer in an idyllic, democracy-obsessed town called Harmony Square. Their mission is to destabilize the town by deliberately sowing discord and division using techniques that mirror those employed in real-world misinformation campaigns.

Over the course of four short levels, players learn and practice five key manipulation tactics:

- Trolling: Provoking strong emotional reactions to incite outrage.
- Emotional Manipulation: Using charged language to evoke fear or anger.
- Artificial Amplification: Exploiting methods like bots and fake likes to exaggerate a message’s reach.
- Conspiracy Theorizing: Crafting and spreading unfounded conspiracies.
- Polarization: Deliberately deepening intergroup divisions by highlighting differences.

By engaging in these strategies in a controlled, playful setting, Harmony Square exposes players to “weakened doses” of manipulative techniques—mirroring the idea behind inoculation theory. Just as a vaccine uses a small, harmless dose of a pathogen to build immunity, the game builds “mental antibodies” that help players recognize and resist such tactics when they encounter them in real-life media contexts.

The game’s tongue-in-cheek, humorous presentation makes the experience engaging while also serving a serious educational purpose: to enhance digital media literacy and reduce susceptibility to disinformation. Studies have shown that playing Harmony Square leads to a significant reduction in the perceived reliability of manipulative content, increased confidence in spotting such tactics, and a lower reported willingness to share such content online, regardless of political ideology.

A study carried out by Roozenbeek & van der Linden (2020) showed that players who engaged with the game Harmony Square exhibited a significant reduction in the perceived reliability of both real and fictional misinformation after playing, indicating that the game effectively diminishes the trust in misleading social media content. Moreover, participants who played Harmony Square reported increased confidence in their ability to identify misinformation and were less likely to express a willingness to share such content with others in their network. This suggests that the game not only educates players about misinformation techniques but also empowers them to resist sharing misleading information.

Cranky Uncle

Cranky Uncle (<https://crankyuncle.com/>) is a free digital serious game developed by climate communication researcher John Cook (in collaboration with creative agency Goodbeast) that uses humor, cartoons, and interactive quizzes to strengthen players’ critical thinking skills and build resilience against climate misinformation.

The game is built around a series of “trails” where players are introduced to the key denial techniques of science denial as defined by the FLICC framework (Cook, 2020) —covering Fake Experts, Logical Fallacies, Impossible Expectations, Cherry Picking, and Conspiracy Theories. Each trail explains one or more of these tactics with engaging, humorous cartoon examples and accompanying text. After the explanation phase, players test their understanding through various quiz formats (true/false, multiple-choice, and identification tasks) that challenge them to spot the misleading tactics in sample arguments. Correct answers earn “cranky points” and help players level up, with their “crankiness” (a playful proxy for resistance to misinformation) increasing as they progress.

The game’s scoring system, immediate feedback, and leveling mechanics provide both motivation and an engaging way to repeatedly practice spotting misinformation. It’s designed for single-player use but can also be incorporated into classroom activities with supplementary teacher guides available.

Unlike passive information delivery, Cranky Uncle uses an active approach: by “becoming” a cranky uncle (i.e., by role-playing as a science denier), players learn firsthand how these misleading tactics work (Weng, 2023). This perspective-taking process encourages them to internalize the logic behind these tactics so that when they later encounter similar techniques in the real world, they are more adept at recognizing and dismissing them. The game emphasizes a logic-based inoculation strategy. Instead of merely bombarding players with factual corrections, it explains the underlying fallacious reasoning (using the FLICC taxonomy) that underpins much of climate misinformation. This “umbrella of protection” helps build cross-topic resilience—equipping players with a general toolkit to critically assess a variety of misleading messages.

There is also a variation of the game called Cranky Uncle Vaccine (<https://crankyunclevaccine.org/>) which focuses on spotting misinformation tricks regarding vaccination and which was especially developed for some African countries. As the game was designed using a co-design methodology it not only enhances the game's relevance for the target audience but also serves as a template for adapting similar interventions in other regions, providing a scalable approach to countering misinformation (Hopkins et al., 2023). The game was effective in improving vaccine attitudes among participants, with a significant number of individuals who were initially hesitant about vaccinations becoming more likely to get vaccinated after playing the game (Cook et al., 2024). Specifically, 58% of those who expressed vaccine hesitancy switched to being somewhat or very likely to get vaccinated post-game.

Go Viral!

Go Viral! (<https://www.goviralgame.com/books/go-viral/>) is a short, online serious game designed to inoculate players against COVID-19 misinformation. The game is based on the mechanics of Bad News. In the game, you take on the role of a disinformation spreader whose goal is to make a false, pandemic-related message “go viral” on social media. To do so, you choose from a range of tactics that mirror real-world disinformation strategies—such as using emotionally charged language, exaggerating statistics, invoking polarizing narratives, and even deploying conspiracy theories about the virus’s origins.

Players craft a fake COVID-19 message and decide which tactics to employ at each stage of the game. Each choice influences your “follower” count and credibility rating—if your tactics are too over-the-top, you risk losing credibility even as you gain reach.

The game is structured in brief levels, each emphasizing different disinformation techniques relevant to COVID-19. As you progress, you learn how specific tactics (e.g., emotional manipulation or polarizing language) can boost virality when used subtly yet effectively. Like the other games as well, Go Viral! provides rapid feedback on your choices. This helps you understand which strategies backfire and which are likely to convince an audience, mimicking the rapid spread—and swift debunking—of online misinformation.

Go Viral! puts players in the role of a disinformation spreader and forces them to choose tactics (like emotional appeals and conspiratorial reasoning) that mimic real COVID-19 misinformation—this active exposure and feedback is a key strength. However, its short duration (about 5 minutes) means the protective effects appear to last only in the short term (roughly one week), and its narrow focus on COVID-19 may limit how broadly those skills transfer to other misinformation topics.

Conclusion

Digital games support inoculation theory by providing pre-emptive cognitive strategies that prepare players to recognize and resist misinformation. Through interactive experiences, these games can simulate exposure to misleading information, allowing players to develop counterarguments and critical thinking skills (Henderson & Pallett, 2024). However, the authors also identified gaps in game design and research related to gamified interventions for misinformation, highlighting that homogeneity in design has left some areas underexplored and that discussions on game design decisions, particularly regarding the integration of inoculation theory components, are often superficial. Prebunking—the practice of equipping individuals with defensive strategies before encountering misinformation—is crucial, as it enables the development of robust mental frameworks that diminish the persuasive impact of deceptive narratives. By actively engaging with the tactics of fake news in a safe, simulated environment, players are not only taught to detect flaws in misleading arguments but also to internalize counterarguments that can be deployed in real-world contexts. This proactive approach is essential for fostering long-term resilience against misinformation, ensuring that protective cognitive strategies are activated before misleading content can influence perceptions and behaviors.

Limitations of Inoculation Theory

In the digital age, applying inoculation theory presents several challenges. The rapid speed and sheer volume of digital content often mean that individuals are exposed to vast amounts of misinformation before any inoculation intervention can be effectively delivered. Moreover, the algorithmic filtering and echo chambers inherent in social media platforms frequently confine users within ideologically homogeneous networks, limiting the reach and impact of counterarguments. Disinformation campaigns have also grown increasingly sophisticated and dynamic, with perpetrators quickly adapting their tactics in ways that can render previously effective inoculation measures less potent. Additionally, while inoculation theory assumes that exposure to counterarguments fortifies existing beliefs, in highly polarized environments such messages can trigger defensive responses or even backfire, further entrenching original viewpoints.

Finally, although laboratory studies have demonstrated the potential of inoculation theory, scaling these interventions to reach broad and diverse online populations remains a significant challenge, particularly when crafting messages that resonate across various cultural, linguistic,

and social contexts. These factors underscore the limitations of inoculation theory in the rapidly evolving digital landscape, highlighting the need for a multifaceted approach that combines psychological insights with technological strategies. The analysis of games designed to combat misinformation and disinformation by Grace & Liang (2023) indicates that emotional engagement is crucial for the effectiveness of these games, as many of the examined games focused more on logical structures rather than evoking strong emotional responses. The authors recommend incorporating emotional elements and personification of characters affected by misinformation to better shape counterarguments and enhance the overall efficacy of the games.

Furthermore, while digital games offer engaging and interactive prebunking strategies, their effectiveness in educational contexts depends heavily on supplementary teacher guidance to ensure that the critical thinking skills developed are deeply internalized and retained over the long term.

Using Serious Games in Educational Contexts

When selecting serious games for an educational context, it is essential to ensure that the game's content aligns with clear learning objectives and is grounded in robust pedagogical principles. The game should offer an engaging, interactive experience that not only introduces students to critical thinking strategies but also mirrors the complexities of real-world misinformation. Factors such as ease of use, adaptability to various learning levels, and the ability to provide immediate, meaningful feedback are crucial. Moreover, the game's design must support active participation, enabling learners to experiment with counterarguments in a safe environment and build cognitive resilience against deceptive information.

Feedback exercises significantly enhance the effectiveness of gamified interventions aimed at reducing misinformation susceptibility, as they improve participants' ability to accurately identify both misinformation and real news after gameplay (Leder et al., 2024). Although serious games using active psychological inoculation (like Bad News) might effectively build resistance against misinformation, the longevity of the inoculation effect varies; while it remains stable for at least 3 months with regular assessments, significant decay occurs over a 2-month period without regular testing, indicating that ongoing reinforcement may be necessary to maintain resistance against misinformation in the long term (Maertens et al., 2021).

Despite the promise of digital games for prebunking, inherent limitations exist that underscore the important role of teachers. Serious games may oversimplify nuanced issues, potentially leading to superficial understanding if not supplemented with guided discussion and contextualization. Digital interventions can also be subject to cognitive overload or might appeal predominantly to digitally literate learners, thereby excluding those who need additional support. In such cases, the teacher becomes indispensable by framing the game within broader curriculum goals, facilitating reflective discussions, and providing the necessary scaffolding to ensure that critical thinking skills are not only developed but also retained over time.

In conclusion, digital serious games offer a novel and promising avenue for bolstering resilience against misinformation. Through immersive, interactive experiences, games such as Bad News, Harmony Square, Cranky Uncle, and Go Viral! provide users with practical counter-strategies that enhance critical thinking and media literacy. While these interventions effectively preempt misleading narratives, challenges remain regarding the longevity of their impact and the necessity for complementary teacher guidance in educational contexts.

Addressing these issues through iterative design improvements and sustained curricular integration could further empower individuals to navigate and challenge the complex digital information landscape. Ultimately, these game-based prebunking strategies have the potential to cultivate a more informed and discerning public, better equipped to resist the rapid spread of fake news in today's digital era.

About the Author

Sonja Gabriel works as a professor for media didactics and media education at the KPH Vienna/Lower Austria, where she is active in the education and training of teachers. Her research focus is on digital game-based learning, gamification and the use of (serious) games for teaching and learning, for teaching values as well as on the pedagogical potential of generative AI in education with a special focus on ethical use of gen AI. In addition, she participates in national and international projects dealing with topics related to teaching and learning with digital media, generative artificial intelligence, information literacy and game design approaches in education.

Social: www.linkedin.com/in/sonja-gabriel-48116041

Website: <https://kphvie.ac.at/pro/sonja-gabriel/home.html>

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