

The Trustworthy Knowledge DLC: A Game-Design-Theory Expansion Pack for Public Services

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ABSTRACT

The proliferation of misinformation and the erosion of shared epistemic foundations challenge contemporary digital societies, yet traditional public knowledge services struggle with engagement, inclusivity, and adaptability. This research argues that the path toward more resilient public knowledge infrastructures requires not superficial gamification but a foundational re-imagination guided by core game design theory. We propose a novel theoretical framework, “Collaborative Knowledge Play,” synthesized from participatory design, motivational game mechanics, and information credibility models. Through a theory-driven methodology integrating critical synthesis, speculative design of conceptual prototypes (e.g., participatory archival games and rumor resilience MMOs), and comparative case study analysis of existing platforms, we develop actionable design principles for systems where verifying, contesting, and co-creating public knowledge become intrinsically meaningful play. The research yields three outcomes: a robust game design theory framework for public knowledge, a catalog of design patterns and pitfalls, and evaluative heuristics balancing ludic engagement with epistemic rigor. This work positions game design as essential for reimagining the digital public sphere, contributing to game studies, information science, and digital civic design.

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Keywords

game design, public knowledge ecosystems, collaborative play, misinformation, participatory design, intersectional pleasures, civic engagement

INTRODUCTION

The proliferation of misinformation and the erosion of shared epistemic foundations present a critical challenge to contemporary digital societies. Traditional public knowledge services often operate on a broadcast or retrieval model, struggling with user engagement, inclusivity, and adapting to the dynamics of user-generated content. Conversely, digital games are masterful systems for motivating sustained, collaborative, and complex problem-solving within diverse communities. This research argues that the path toward more resilient public knowledge infrastructures lies not merely in applying superficial game-like elements (“gamification”), but in a foundational re-imagination guided by core game design theory. We propose a novel theoretical framework that synthesizes principles from participatory design, motivational game mechanics, and information credibility models. This framework, “Collaborative Knowledge Play,” aims to provide a blueprint for designing systems where the very acts of verifying, contesting, and co-creating public knowledge are experienced as intrinsically meaningful play. This directly engages with the DiGRA 2026 theme of “Intersectional Pleasures” by investigating how the complex pleasures derived from systemic mastery, narrative agency, and community participation — core tenets of game design — can be architected to foster equitable and trustworthy knowledge ecosystems.

THEORETICAL FRAMEWORK AND METHODOLOGY

Our methodology is interdisciplinary and theory-driven, comprising three integrated phases. First, we conduct a theoretical synthesis, critically analyzing and integrating concepts from game design theory (such as endogenous value, possibility spaces, and feedback loops), information science models of credibility and community-based knowledge construction (aligning with Alton Chua’s work on UGC quality and rumor propagation), and critical studies on intersectionality and participatory culture. This synthesis will produce our “Collaborative Knowledge Play” framework, which posits key design dimensions: Procedural Rhetoric for Verification (how game rules model good epistemic practices), Intersectional Player Positioning (how systems acknowledge and leverage diverse identity-based knowledges), and Scalable Social Pleasure (designing for trust and repute within a contributory commons).

Second, we employ a critical speculative design approach. Using the developed framework, we will generate and analyze a series of high-fidelity conceptual prototypes for hypothetical public knowledge games. Examples include a Participatory Archival Memory Game where players collaboratively reconstruct historical events from fragmented, multi-perspective sources, and a Rumor Resilience MMO where guilds work to map and defuse misinformation networks using game-theoretic tools. These prototypes are not meant for development but serve as “theory-heavy objects” to stress-

test and refine our framework through expert workshops and focus groups with game designers, information professionals, and community advocates.

Third, we will execute a comparative case study analysis of existing digital platforms that occupy the ambiguous space between “ game ” and “knowledge tool” (e.g., Foldit, WikiRace, certain citizen science apps). This analysis will be guided by our framework to identify emergent best practices, latent design patterns, and gaps where current implementations fail to deliver either robust knowledge outcomes or deeply engaging play.

CONTRIBUTIONS

This research is expected to yield three primary outcomes.

The foremost is the articulation of a robust, original game design theory framework specifically tailored for the context of public knowledge and information integrity. This framework will translate abstract information science challenges into concrete, actionable game design vocabulary and principles.

Secondly, the research will produce a critical catalog of design patterns and pitfalls for creating systems that balance ludic engagement with epistemic rigor, particularly highlighting how design choices can either amplify or marginalize intersectional perspectives and contributions.

Finally, the project will generate a set of evaluative heuristics—grounded in both game design and information quality metrics—for assessing how well a given system facilitates “collaborative knowledge play.” These heuristics will consider not just output quality but also the experiential quality of participation across different user identities.

CONCLUSION

This study positions game design not as a set of cosmetic tools for engagement but as a critical theoretical and practical discipline essential for reimagining the digital public sphere. By developing a dedicated game design theory framework for public knowledge ecosystems, we aim to provide scholars, system designers, and policymakers with a new lens and toolkit. This work argues that fostering a healthier information environment requires designing spaces where the procedural, social, and narrative pleasures of games are strategically aligned with the civic, intellectual, and ethical pleasures of building a shared, trustworthy understanding of our world. The proposed framework offers a pathway to design such spaces intentionally, making a significant contribution to the fields of game studies, information science, and digital civic design.

REFERENCES

- Constantinescu, T., Devisch, O., & Kostov, G. (2017). City Makers: Insights on the Development of a Serious Game to Support Collective Reflection and Knowledge Transfer in Participatory Processes. *International Journal of E-Planning Research*, 6(4), 32–57.
- Gordon, E., & Baldwin-Philippi, J. (2014). Playful Civic Learning: Enabling Reflection and Lateral Trust in Game-based Public Participation. *International Journal of Communication*, 8, 759–786.
- Raphael, C., Bachen, C., Lynn, K.-M., Baldwin-Philippi, J., & McKee, K. A. (2010). Games for Civic Learning: A Conceptual Framework and Agenda for Research and Design. *Games and Culture*, 5(2), 199–235.
- Harrer, S. (2019). Intersexuality and the Indie Game. *First Person Scholar*. Retrieved from <http://www.firstpersonscholar.com/intersexuality-and-the-indie-game/>
- Salen, K., & Zimmerman, E. (2003). *Rules of Play: Game Design Fundamentals*. MIT Press.
- Hunicke, R., LeBlanc, M., & Zubek, R. (2004). MDA: A Formal Approach to Game Design and Game Research. In *Proceedings of the AAAI Workshop on Challenges in Game AI (Vol. 4)*.
- Blomé, O. (2025). *Gameful Participation: The Use of Gamification in Citizen Participation within the Public Space Planning Process (Master's thesis)*. Swedish University of Agricultural Sciences.