An Exploration in Ethics, Empathy, and Inclusion in Citizen Science / Kat Schrier (in person and virtual)

Over the past decade, I have been asking questions around the ethics of citizen science, specifically in relation to using games, gamification, and playful interactions to engage with the public to collect and analyze data, and provide time and labor (see for instance, Kücklich's concept of playbour). Citizen science games like *Foldit*, *EteRNA*, *Eyewire*, and *StallCatchers* can engage the public, including amateurs and non-scientists, in solving large-scale problems by contributing and analyzing data and perspectives through gameplay, producing new knowledge. While these games offer societal benefits, such as advancing research on galaxies, quantum computing, or diseases like cancer and Alzheimer's, there has been less attention to their ethical and social implications. For instance, while the educational and democratizing nature of citizen science can be quite beneficial, there are many possible issues, such as in how data is handled, the value placed on participants' in-game work, and how ethics are integrated into a game's design. I am especially concerned with questions of how marginalized populations are enabled (or not enabled) to play citizen science games, how games themselves might be marginalized by the scientific community, and how that affects how any "science" is interpreted, accepted, and instantiated as knowledge. I am also interested in questions related to the intersection of care with citizen science games, and how generative AI might further complicate questions of authority.

A few of my works have specifically discussed the intersection of games, citizen science, and ethics. First, my book, *Knowledge Games* (Johns Hopkins University Press) focuses on how games can be used to solve real-world problems and produce new knowledge by involving the public in scientific challenges (Schrier, 2016). I investigate the design of these types of games, as well as the historical, ethical, social, and educational implications of these participatory sociotechnical platforms. I question whether games can be fully accepted by the public as knowledge-making communities. Second, my article, "The Ethics of Citizen Science and Knowledge Games: Five Emerging Questions About Games that Support Citizen Science," in *Gamevironments*, shares different provocations, such as how we might problematize the use of a game (*Play to Cure: Genes in Space*) that used real breast cancer data and makes it into a fun journey through space (Schrier, 2021a). Or, how we might handle data divides, in that only *some* people are the "interpreters" of the results, while *others* are the gatherings and givers of data. Or, how some people have access to the tools to reveal the mechanisms behind big data sets, while others do not. I also explore how games and interactive platforms can help mitigate some of these challenges by educating participants about the ethical responsibilities they have when contributing to science. Recently, I also published an article on how both the creators and players of citizen science games engage in leadership practices. For instance, by collaborating with others, solving problems, and performing ethically in the game, they serve as leaders for enacting new knowledge (Schrier, 2024).

In addition, I have written publications at the intersection of ethics and games. My book, *We the Gamers* (Oxford University Press) delves into how to use games for ethical understanding, social change, and moral education (Schrier, 2021). I discuss the importance of using games to not only solve real-world problems, but also cultivate the skills to better support civic engagement and problem solving, like empathy, compassion, perspective-taking, and an inclusive mindset. Likewise, my article, "Designing role-playing video games for ethical thinking," in *Educational Technology Research and Development* looks at how role-playing games like *Fable III* can enhance ethical thinking skills like reflection, empathy, and critical analysis. A book chapter, "Gamification and Leadership," specifically explores the ethics of gamification, and discusses how it may exploit participants, offering extrinsic rewards without fostering meaningful learning or empowerment (Schrier, 2017). Consider, for instance, competitive leaderboards that do not encourage collaboration or deep problem-solving, nor have any significant connection to the game play or goals. Additionally, while gamification may sometimes increase engagement, it does not always improve the quality of outcomes, and elements like badges may motivate

some but discourage others, especially if they are not designed to be inclusive and achievable for all participants.

I have also explored how the game design process itself can affect participants' engagement and well-being, foster belongingness and self-expression, and develop skills like compassion, allyship, and inclusiveness. For instance, in our game jams in the U.S. and Nigeria we found that the process of designing has ethical considerations, such as who can access design tools or who is empowered to decide how the design emerges (Schrier, et al., 2021).

Finally, I am extremely mindful of the importance of equity and inclusion in citizen science games and beyond. My co-edited collection, *Learning, Education, and Games: 50 Games for Inclusion, Equity, and Justice* explores how a game and gaming community might enhance or hinder one's sense of belonging and care (Schrier et al., 2024). It asks questions like: does a game reflect the diversity of the world's peoples, cultures, and stories? Does it cultivate an inclusive community? How might citizen science games further (in)equities in interpretative communities or access to science. Moving forward, I am particularly interested in the importance of caring for one's participants, and how we can design citizen science games to ethically care for our players. I am also interested in the ethics of generative-AI bots in citizen science games, and how they might enhance and problematize knowledge-producing.

Citations

Kücklich, J. (2005). Precarious Playbour: Modders and the Digital Games Industry. The Fibreculture Journal. https://five.fibreculturejournal.org/fcj-025-precarious-playbour-modders-and-the-digital-games-industry/

Schrier, K. (2021). *We the gamers: How games teach ethics and civics*. New York, NY: Oxford University Press.

Schrier, K. (2016). *Knowledge games: How playing games can solve problems, create insight, and make change.* Baltimore, MD: Johns Hopkins University Press.

Schrier, K., Kowert, R., Leonard, D., & Porkka-Konturri, T. (2024). *Learning, education & games vol. 4: 50 games for inclusion, equity, and justice*. Pittsburgh, PA: ETC Press (Carnegie Mellon).

Schrier, K. (2024). Leadership through Citizen Science Games. *Journal of Leadership Studies*. https://doi.org/10.1002/jls.21878

Schrier, K. (2017). Designing role-playing video games for ethical thinking. *Educational Technology Research and Development*. 65(4): 831-868

Schrier, K. (In press). Gamification and Leader Development. In D. Rosch, S. Allen, & D. Jenkins (Eds.) *Moving the Needle: Evidence-based Strategies for Developing Leader Capacity*. Information Age Publishing.

Schrier, K., Ohu, E., Bodunde, I, Babatunde, A, Alugo, M., & Emami, C. (2021). Piloting a Game Jam in Nigeria to Support Empathy and Compassion. *Proceedings of ACM Game Jams, Hackathons, and Game Creation Events (ICGJ)*. Virtual.

Schrier, K. (2021). The Ethics of Citizen Science and Knowledge Games: Five Emerging Questions, *Gamevironments*. https://journals.suub.uni-bremen.de/index.php/gamevironments/article/view/147/131