Speak with blocks: Minecraft, environmental education and activism

Gaia Amadori
Catholic University of the Sacred Heart of Milan, Italy
gaia.amadori@unicatt.it

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EXTENDED ABSTRACT

In an era where environmental issues and sustainability challenges are at the forefront of global concerns, the quest for innovative and engaging communication strategies has led to the emergence of digital games as powerful tools for environmental awareness and education. While conventional media often struggle with audience apathy, denial, and misinformation, video games are growingly considered promising interactive platforms that can enhance awareness, critique, and even inspire behavioral changes. Games that allow for simulation, in particular, are increasingly integrated into environmental campaigns as key communication tools to reach younger audiences. A notable example is the "To The Last Tree Standing" campaign, launched by Greenpeace in partnership with a multinational advertising company, that recreated Poland's Białowieża Forest in *Minecraft* (Mojang, 2011) to raise awareness about logging consequences. After attracting widespread attention among young people and streamers, the map was altered to show the forest nearly destroyed, powerfully illustrating the impact of deforestation. The campaign reached millions, sparked significant media coverage, and contributed to public pressure that helped halt real-world logging in the forest.

In recent years, a growing scholarship has recognized the relevance of video games for ecological purposes, leading to the emergence of a new category: "ecogames" (op de Beke et al. 2024; Raessens 2019). Two main strands of research emerged in this regard. The first one includes empirically oriented studies, particularly systematic and methodological reviews, which primarily illustrate how serious games (Ritterfeld et al. 2009) are recognized as effective tools for raising awareness and promoting behavioral changes related to environmental issues, particularly climate change (Fernández Galeote & Hamari 2021, Ouariachi et al. 2019). The second one consists of ecocritical studies that explore the unique formal, aesthetic, and interactive properties of video games as tools for ecological awareness and sustainability education (Chang 2019, Abraham 2022, Bohunicky 2014).

While both these strands emphasize the persuasive and educational potential of digital games for environmental purposes, they predominantly adopt a 'software-centric perspective', focusing on discrete video games as the primary analytical unit. This approach risks overlooking the broader meaning-making practices that arise around specific ecological issues or campaigns. These practices involve a wider network of stakeholders, including NGOs, corporations, and public sector entities, all of whom are more and more interested in leveraging video games' potential in their communicative efforts. Additionally, this network encompasses the gaming ecosystem itself, which includes developers, designers, and the communities of streamers and players.

Furthermore, as these diverse stakeholders contribute to shaping the narrative surrounding the video game, examining the paratexts becomes essential (Consalvo 2017). Elements such as marketing materials, content created by users, and discussions within the gaming community can provide valuable insights into both the potential benefits and challenges of employing certain titles as instruments for environmental advocacy.

Building on this, to explore how video games can function as effective tools for sustainability education and ecological activism, this contribution adopts a systemic perspective that emphasizes the intricate interrelations and mutual dependencies among stakeholders - and between stakeholders and the game itself - that shape the specific ways video game affordances are mobilized for 'green activation' (op de Beke et al. 2024). Accordingly, the focus is on co-shaping processes—namely, the dynamic and reciprocal interactions through which the actors mutually negotiate and strategically mobilize and/or adapt game features and community to serve their objectives and interests. These processes can be explored by examining the intertwining among the game software, its assets, the campaign and its promoters, players, commentators (such as streamers and journalists), and the broader ecological issue at stake. This perspective recognizes that video games can play multiple and at times contradictory roles: they may be harnessed for genuine sustainability efforts, serve primarily branding purposes, or even function as instruments of greenwashing (Raessens, 2019).

The study draws upon two top-down environmental campaigns, both using the popular 3D sandbox game *Minecraft* (Mojang 2011), which allows users to build and explore polygonal environments, thus representing an ideal platform for simulating real-world dynamics without the constraints of cost, time, or safety.
The first case study is a 2021 institutional campaign in Venice, Italy, where developers built an interactive map of the Venetian lagoon to promote sustainable development through a series of green practices, such as cultivating urban gardens, fining drivers using polluting vehicles, or creating short-supply chains and solidarity economies. The second one is a 2020 corporate campaign where grade school pupils built a 3D reconstruction of the local power plant to model water uses (aqueducts, discharges, industrial uses, and energy) to ensure the protection of the waters in the Po Valley region and encourage imagining an ideal and environmentally sustainable city.
Through semi-structured interviews with the campaign and software developers (N=3) as well as corporate and institutional representatives (N=3), and content analysis of the paratexts (campaign website, media coverage, user-generated content on Facebook, YouTube, and Twitch), this research outlines an analytical model to examine the role of video games in environmental communication and sustainability education.

Among other findings, the results show how these interdisciplinary collaborations combine a wide array of expertise, from technical skills to deep domain knowledge, as well as diverse interests, motivations, and goals that ultimately require trust and mutual adaptation. This process informs concrete decisions about which digital game to select, which mechanics to employ or adapt, where to distribute the purpose-designed content (such as through official game stores or external DLC platforms), which streamers to engage and how their involvement aligns with the campaign's objectives, as well as strategies for media outreach. In this context, branding objectives often seem to take precedence over environmental education, especially when promoters are primarily interested in enhancing their reputation with a broad audience. In addition, another key aspect that emerged is the need for careful negotiation to strike the right balance between educational and entertainment value, to avoid the "chocolate-covered broccoli" effect, as one interviewee described. This metaphor accounts effectively for those games where the educational aspects and the entertainment are poorly blended, making the experience unappealing and ineffective for both learning and fun.

Furthermore, each virtual map serves as a 'game within the game'—a serious game intentionally created within *Minecraft*—which leverages the platform's popularity among young audiences and its unique affordances to root sustainability challenges in a local, tangible virtual socio-ecological context that mirrors the audience's real-world experiences. This approach increases the relevance and engagement of learners, making education more meaningful and encouraging active participation (Senka et al., 2024).

Drawing upon these aspects, the model comprises three key dimensions: 1) *Ecological Issue*, i.e the specific environmental challenges or sustainability topics addressed, including related societal controversies; 2) *Network of Actors and stakeholders*, including corporations, public sector entities, developers, designers, and gaming communities (e.g., streamers, modders) who contribute to shaping the software and the campaign; 3) *Video Game Ecosystem*, encompassing the game software, its assets and affordances, as well as paratextual elements like community interactions and user-generated content on social media and video-sharing platforms.

By integrating these dimensions, the model highlights the co-shaping processes between games and their surrounding networks. It emphasizes that video games are not isolated tools but are situated within a distinctive socio-ecological context, that must be considered to effectively communicate sustainability messages and educate about environmental challenges. Moreover, this perspective allows for a nuanced understanding of trade-offs (e.g., between knowledge dissemination, social capital, political support...) navigated by the stakeholders to secure funding and bring such campaigns to fruition.

While this study centers on Minecraft as a sandbox game, the proposed analytical model is intended to be applicable across a variety of game genres—including, for example, strategy games such as *Civilization VI: Gathering Storm* (Firaxis Games 2019), simulation games like *The Sims 4: Eco Lifestyle* (Maxis and The Sims Studio 2020), and even initiatives within casual games such as *Angry Birds Champions or Earth* (Rovio 2015). This broader applicability allows uncovering both similarities and differences among games with varying features, taking into account their unique affordances, gameplay dynamics, and the structure of their streamer and player communities. By employing this comparative lens, the model can facilitate a comprehensive analysis of how different video game genres can function as platforms for sustainability education, highlighting both shared approaches and distinctive elements across

gaming experiences. In addition, by considering the broader context in which these video games are situated, this research provides valuable insights for designing future environmental campaigns leveraging digital games.

Ultimately, this contribution provides new perspectives on how video games can serve as powerful tools for promoting sustainability and activism, moving beyond a solely software-focused approach.

REFERENCES

Abraham, B. J. 2022. *Digital games after climate change.* Cham, Switzerland: Palgrave Macmillan.

Bohunicky, K. M. 2014. *Ecocomposition: Writing ecologies in digital games. Green Letters* 18(3): 221–235. https://doi.org/10.1080/14688417.2014.964283

Chang, A. Y. 2019. *Playing nature: Ecology in video games*. Minneapolis, USA: University of Minnesota Press.

Consalvo, M. 2017. When paratexts become texts: De-centering the game-as-text. *Critical Studies in Media Communication* 34(2): 177-183. https://doi.org/10.1080/15295036.2017.1304648

Firaxis Games. 2016. Civilization VI. *I: Gathering Storm* [PC, Mac, Linux, iOS, Nintendo Switch, PlayStation 4, Xbox One]. Firaxis Games, 2K Games.

Fernández Galeote, D., & Hamari, J. 2021. Game-based climate change engagement: Analyzing the potential of entertainment and serious games. *Proceedings of the ACM on Human-Computer Interaction* 5(CHI PLAY): 1–21. https://doi.org/10.1145/3474653

Maxis and The Sims Studio. 2020. *The Sims 4: Eco Lifestyle [*PC, Mac, PlayStation 4, Xbox One]. Electronic Arts.

Mojang. 2011. *Minecraft* [Microsoft Windows, Macintosh OS, Linux]. Mojang.

op de Beke, L., Raessens, J., Werning, S., & Farca, G. (2024). *Ecogames: Playful perspectives on the climate crisis*. Amsterdam University Press.

Ouariachi, T., Olvera-Lobo, M. D., Gutiérrez-Pérez, J., & Maibach, E. 2019. A framework for climate change engagement through video games. Environmental *Education Research* 25(5): 701–716. https://doi.org/10.1080/13504622.2018.1545156

Raessens, J. (2019). Ecogames: Playing to save the planet. In *Cultural Sustainability* (pp. 232-246). Routledge.

Ritterfeld U., Cody M. & Vorderer P. 2009. *Serious games: Mechanisms and effects*. Routledge.

Rovio. 2015. *Angry Birds Champions for Earth* [In-game event]. Retrieved from: http://www.rovio.com/news/rovio-and-birdlife-international-team-save-angry-birdspacific.

Senka, G., Tramonti, M., Dochshanov, A. M., Jesmin, T., Terasmaa, J., Tsalapatas, H., et al. 2024. Using a game to educate about sustainable development. *Multimodal Technologies and Interaction* 8(11): 96. https://doi.org/10.3390/mti8110096