

Playing for the Planet? A Process-Centric Framework for Analyzing Ecogames in Commercial Platforms*

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As environmental crises intensify, video games have emerged as vehicles for sustainability communication. Stakeholders increasingly pursue “green activations” – campaigns mobilizing commercial gaming platforms to develop ecogames aimed at environmental awareness. This article refines and operationalizes a process-centric analytical framework to examine how socio-ecological contexts, campaign structures, and video game ecosystems co-shape ecogame design and circulation in such initiatives. Through a case study of a museum-led *Minecraft* campaign in Venice, employing stakeholder interviews, paratext analysis, and socio-material mapping, findings reveal persistent tensions: platforms reducing infrastructure and audience acquisition costs while imposing constraints on content design and distribution; awareness-raising aims without impact assessment; the perceived accessibility of popular platforms masking pay-to-access barriers; and erosion of institutional control as ecogames transition to third-party commercial distribution. The refined framework offers analytical tools for comparative research, enabling scholars and practitioners to critically navigate the processes shaping sustainability communication within commercial gaming platforms.

Keywords: Video games, Sustainability communication, Environmental education, Minecraft, Analytical Framework

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Introduction

Amid escalating environmental crises, digital games have gained recognition as vehicles for sustainability communication, leading to the emergence of a new analytical category: ecogames (Abraham, 2022; op de Beke et al., 2024). This umbrella term encompasses purpose-built serious games¹ (Ritterfeld et al., 2009) designed to educate players about environmental issues as well as “green activations” (UNEP, 2021), sustainability campaigns that integrate environmental themes into video games, particularly on popular commercial platforms. A significant share of these initiatives is promoted by external stakeholders – such as cultural institutions, NGOs, public bodies, and companies – who repurpose commercial games to deliver sustainability messages by leveraging existing player communities and familiar mechanics.

These campaigns operate at a complex intersection: they mobilize stakeholder configurations to translate environmental communication within specific socio-ecological contexts, relying on platform infrastructures that shape the broader video game ecosystem. Yet, the processes through which these dimensions interact to influence ecogame design and circulation remain largely unexamined. This study therefore asks: how do socio-ecological context, stakeholder configurations, and video game ecosystem co-shape green activations developed on commercial gaming platforms? To address this question, the study advances a process-centric multidimensional framework building on an analytical model originally developed for environmental activism campaigns (Amadori, 2024), here refined and operationalized through a qualitative case study of a museum-led *Minecraft* (Mojang, 2011)² educational campaign in Venice. The contribution is threefold. First, it extends the analytical model beyond single-case limitations by identifying new dimensions and categories that capture the co-shaping processes characterizing green activations. Second, it empirically illuminates how these processes unfold in practice, revealing tensions and trade-offs. Third, it refines the framework to enhance its applicability across diverse contexts, laying groundwork for future comparative research.

The paper is structured as follows: the literature review situates green activations at the intersection of ecogames scholarship and platform studies; the methods detail the case study design along with data collection and analysis techniques; results present findings articulated through campaign design and evaluation; the discussion refines the analytical framework; and conclusions outline implications and future research directions.

Literature review

Over the past two decades, digital games have emerged as significant tools for enhancing awareness of environmental issues and broader sustainability challenges, spanning serious games from non-profits and research initiatives to mainstream titles and industry-wide efforts such as the Playing for the Planet Alliance, launched in 2019 by the UN Environment Programme and GRID-Arendal. This momentum has led to the formulation of ecogames as

a distinct analytical category that encompasses video games that seek to reduce their ecological footprint through sustainable production and gameplay practices (Abraham, 2022) and/or foster sustainability-oriented attitudes and behaviors among players (op de Beke et al., 2024).

Ecogames can be grouped into four main types (op de Beke et al., 2024): (1) independent/artistic games, (2) educational serious games, (3) mainstream entertainment games integrating sustainability challenges, and (4) commercial titles addressing environmental themes via content or special features. The last type includes green activations, which take the form of either studio-led in-game events developed with institutional partners³ or campaigns by external stakeholders (cultural institutions, NGOs, governmental bodies, and corporate actors) that repurpose popular gaming platforms to deliver educational content. Many of these initiatives rely on sandbox games⁴ – particularly *Minecraft*, drawing on mechanics that facilitate simulation of real-world environmental scenarios (Chang, 2019; Kelly & Nardi, 2014; Nguyen, 2016) – and user-generated content platforms to leverage established communities and marketplace distribution channels (Murphy, 2024).

Existing scholarship on ecogames has focused on two dimensions: software characteristics and player communities. On the one hand, software-centric approaches treat games as artifacts and examine them along several lines. These include systematic reviews of technical features, narrative design, and mechanics (e.g., Ahmadov et al., 2025; Fernández Galeote et al., 2025; Blake et al., 2025); ecocritical readings that analyze games as environmental texts shaping human-environment relationship (Aliano & Crowley, 2024; Kłosiński, 2025; Chang, 2019); empirical studies that measure educational and behavioral outcomes (Georgiou et al., 2023; Ho et al., 2022; den Haan & van der Voort, 2018; Fjællingsdal & Klöckner, 2019); design frameworks that identify features sustaining engagement and learning (Bjørner & Schønau-Fog, 2024; Ouariachi et al., 2019); and industry/material studies that assess gaming's environmental impact (Eggel & Fizek, 2026; Abraham, 2022; Mills et al., 2019). On the other hand, player-focused approaches shift attention to gaming communities as sites where ecological thinking emerges through collaborative play, critical metagaming practices (Lamerichs, 2024), and creative reinterpretations – such as mods⁵ (Bohunicky, 2017) – that drive sustainability discourse and pro-environmental behaviors (Milburn, 2024; Werning, 2021).

Across these strands, green activations remain understudied compared to purpose-built serious games or eco-themed entertainment titles (Marín-Rubio et al., 2026). Research has paid limited attention to how external stakeholders mobilize commercial titles as infrastructures for sustainability communication (Werning, 2021), often overlooking the co-shaping dynamics through which socio-ecological contexts, platform affordances, campaign structures, and stakeholder configurations reciprocally influence ecogame design and deployment.

First, the socio-ecological context in which campaigns are situated affects not only which environmental themes acquire salience, but also which gaming platforms become viable communication channels. Environmental issues are inherently place-based: climate

vulnerabilities and sustainability priorities manifest differently across territories, shaping which themes resonate locally while connecting to global challenges (Gupta et al., 2007). This territorial specificity intersects with platform accessibility: gaming platforms exhibit uneven geographic distribution and demographic reach across contexts, creating strategic dilemmas for commissioners who must balance locally relevant environmental issues with platform selection that can reach target audiences (Georgiou et al., 2023). Also, platform choice is conditioned by institutional considerations of appropriateness and reputational alignment: commissioners may avoid platforms whose core mechanics – such as player-versus-player combat or competitive elimination – contradict their educational missions or risk compromising institutional credibility (Werning, 2021; Denicolai & Domenici, 2023).

Second, the selection and representation of environmental themes in sustainability campaigns are constrained by platform affordances and gameplay mechanics. Environmental communication presents specific challenges: climate issues involve complexity, long time scales, and diffuse causality that complicate linking individual actions to collective outcomes, while also serving educational purposes of increasing ecological literacy and promoting behavioral change through accessible messaging (Heneghan et al., 2024; Guenther et al., 2024). Within gaming contexts, environmental issues must be rendered ‘playable’ – translated into interactive mechanics that align with a platform’s core design (Bogost, 2007). This requirement shapes which sustainability topics become foregrounded and how they are framed: complex ecological processes may be simplified to fit game logics, certain environmental challenges may prove more amenable to gamification than others, and the “procedural rhetoric” (Bogost, 2007) embedded in gameplay mechanics – the messages conveyed through game rules and systems rather than explicit narrative – may reinforce or challenge particular environmental framings. Moreover, green activations operate within broader media ecologies where ecogames function alongside – and in relation to – other communication channels such as social media, press coverage, institutional websites, and physical events (Consalvo, 2017). This transmedia dimension means that ecogames do not operate in isolation but as components within wider communicative assemblages, where paratexts⁶ (Consalvo, 2017) and cross-platform circulation patterns shape how sustainability messages are encountered, interpreted, and amplified.

Third, platform policies governing content production and distribution fundamentally shape the scope and limits of green activations. Research demonstrates how technological architectures structure what actions become feasible while embedding particular governance logics (Hung et al., 2024; Murphy, 2024; Evans et al., 2017), how creative labor navigates tensions between objectives and platform constraints (Sotamaa & Svelch, 2021; Consalvo & Paul, 2020), and how platforms function as socio-technical assemblages where technical features, organizational arrangements, and economic interests mutually constitute one another (Chia et al., 2020; Nieborg & Poell, 2018; Plantin et al., 2018). In user-generated content platforms, such as *Minecraft* and *Roblox* (Roblox Corporation, 2006), marketplaces function as repositories where users distribute game worlds, often freely, without direct compensation beyond the promise of visibility (Duffy, 2020; Comunello & Mulargia, 2015).

However, visibility itself is governed by algorithmic curation, content moderation policies, and approval processes that privilege certain content forms while marginalizing others (Thorhauge, 2022; Gillespie, 2018; Caplan & boyd, 2018). This dynamic is particularly salient for green activations, where institutional actors developing content must navigate commercial usage guidelines, branding restrictions, and marketplace gatekeeping mechanisms that determine whether and how their sustainability campaigns reach audiences.

Yet this very platform infrastructure – with its established user bases, low-barrier distribution channels, and built-in circulation mechanisms (Murphy, 2024) – simultaneously enables actors to pursue communication strategies that would be more difficult to articulate through standalone applications. Leveraging existing gaming communities reduces audience acquisition costs (Johnson & Woodcock, 2021), platform-native distribution provides visibility without substantial marketing investments (Nieborg & Poell, 2018), and participatory cultures allow actors to position themselves as community participants rather than external advertisers, potentially enhancing legitimacy and engagement (Jenkins et al., 2016; Paul, 2020). Thus, while platform governance mechanisms constrain what forms of sustainability communication become possible, the same infrastructures simultaneously afford strategic opportunities that shape how diverse stakeholders approach green activations.

Commercial gaming platforms are therefore complex environments where multiple actors, interests, and constraints intersect: a perspective essential for understanding green activations. A previously developed multidimensional model (Amadori, 2024) began examining these dynamics in environmental activism campaigns by foregrounding the interdependencies between the broader ecological controversy at stake, stakeholder networks, and gaming ecosystem. However, its derivation from a single high-controversy deforestation case in Poland limited its empirical scope and transferability. This contribution applies the model to a markedly different empirical domain – a museum-led institutional campaign in Venice – to identify refinements in the original formulation, expand its applicability, and develop a more robust analytical framework for comparative research across diverse green activations.

Methods

The case study

Over recent years, Venice has emerged as a powerful symbol of climate change challenges and the pressing need for sustainable development, both nationally and globally. Given this context, the city's 1600th anniversary in 2021 provided the occasion for the educational division of the 20th-century museum in Mestre, the municipality's largest and most densely populated district, to launch the "Climate Hero" campaign. Targeting children aged 8-11, the initiative sought to build awareness of urban sustainability – a central theme of the museum's

mission – and, more broadly, about the UN's Agenda 2030 Sustainable Development Goals. The campaign revolves around an interactive map of the Venetian lagoon developed in *Minecraft Bedrock Edition* by a small Italian software house, commissioned and co-designed by the museum. In this map, players embody a "sustainability champion" who completes missions linked to concrete environmental practices: cultivating urban gardens, discouraging polluting vehicles, promoting short food supply chains and solidarity-based economies, regulating tourist flows, and investing in renewable energy. Completing missions awards in-game currency that can be reinvested in green technologies distributed across the virtual city, establishing a straightforward cause-and-effect loop between individual actions and collective urban benefits. To suit the 8-11 age group, the gameplay is structured around clear objectives, limited complexity, and immediate feedback, deliberately avoiding competitive elimination mechanics.

The Climate Hero campaign was selected as a case study for three interconnected reasons. First, the commissioning institution explicitly positions sustainability and urban development at the core of its educational mission, making this an analytically productive example of how cultural actors mobilize commercial platforms for environmental communication.

Second, the project is built on *Minecraft*, one of the most widely used sandbox platforms among children and pre-teens, and a recurrent choice in educational green activations. Moreover, *Minecraft* constitutes a paradigmatic instance of a platformized ecosystem: a multi-layered infrastructure that extends well beyond the game itself, encompassing an official marketplace – governed by Mojang, the development studio and publisher behind *Minecraft* – through which creators publish, distribute, and monetize custom content, a network of servers hosting community-created worlds, and a sprawling constellation of external third-party websites – such as *MinecraftMaps.com* and *Planet Minecraft* – that function as distribution channels, allowing users to share and download user-generated content to embed directly into their game. This architecture involves multiple actors each operating under distinct and not always aligned logics of access, visibility, and commercial interest. Selecting *Minecraft* therefore allows the study to examine not only how sustainability messages are designed within a popular gaming environment, but also how platform structure itself mediates, constrains, and potentially redirects the communicative and distributional trajectories of educational content once it enters circulation.

Third, while Venice constitutes a geographically and institutionally specific context, it nonetheless embodies urgencies and challenges that transcend its local boundaries. Rising sea levels, overtourism, the tension between urban livability and global visibility, and the fragility of historic ecosystems under climate pressure are processes that resonate far beyond the lagoon, and that characterize other cities and coastal areas worldwide. Venice thus functions as a locally grounded but globally legible case through which broader dynamics of sustainability communication can be meaningfully explored.

Data collection and analysis

To investigate both the campaign's design and implementation, the study involved semi-structured interviews with key stakeholders: the museum's Head of Educational Programs (HEP) and the CEO of the software house (CSH) responsible for creating the virtual map. These interviews focused on four main areas: (1) the project's origins, intended audience and objectives to clarify the motivations driving the initiative; (2) narrative and game design choices; (3) imaginaries and representations of sustainability; (4) potential critical issues and misalignments between developers and commissioners. Conducted online in 2023, the interviews were manually transcribed and analyzed in MAXQDA using grounded theory methodology (Charmaz, 2014), which involved iterative, inductive, comparative coding, and thematic aggregation to identify key themes.

Furthermore, campaign-related content was retrieved from Facebook and YouTube, the main channels used for dissemination. Secondary sources were also collected, including online media outlets (N=15) and museum marketing materials – i.e. articles on the institutional website (N=4) and launch posts on social media (N=4). The keywords “Climate Hero” AND “Minecraft” AND “Venice” were used in search engines and social media platform searches to define the scope of the investigation. These materials, as salient paratexts (Consalvo, 2017), were examined through an inductive thematic approach (Völcker, 2020) with two main aims: (1) reconstructing the framing strategies through which the commissioning institution publicly presented the campaign and the Minecraft map, and (2) identifying indirect indicators of visibility and engagement⁷ – such as number of downloads, views, likes, and comments.

In addition, the analysis employed socio-material mapping (Belli, 2021) to trace networks of associations – including resources, competencies, roles, and relationships – across stakeholders. This mapping revealed the interdependencies and exchanges that shaped the campaign's development and implementation.

Finally, building upon collected data, the previously developed analytical model was applied to examine the campaign's structure through its three key dimensions, with the dual purpose of analyzing the case and iteratively refining the model itself.

Results

The “Climate Hero” initiative emerged from the museum's educational mission, which reflects the priorities of its parent foundation – a former banking institution that finances itself through donations, dedicated funds, and competitive national and international grants. As outlined by the HEP, the foundation emphasizes local capacity building and advancing the UN's 2030 Agenda through place-based educational programs.

Within this framework, the campaign specifically targeted children aged 8-11, a demographic that will experience the most direct impacts of climate change. As the HEP explained, the museum sought to create “a product that could reach a broad audience, be

widely accessible, and use a universal language” to address the environmental challenges confronting the city and sustainable development strategies.

The campaign also responded to institutional interests around public engagement and visibility. Since opening in 2018, the museum had navigated a complex reception, with local attitudes ranging from enthusiasm to skepticism. To cultivate stronger community ties and appeal to a younger audience, the Educational Department introduced gaming as an “educational lure” (HEP), eventually developing *Edu Craft*, a long-term program that deploys *Minecraft* to engage children in learning about sustainability, citizenship, and urban planning. Over several years, museum educators found the platform especially effective for reaching children “who are not usually leaders, who struggle with traditional school experiences, but in contexts like these demonstrate great skill and a remarkable ability to play” (HEP).

The initiative emerged directly from this innovative program. The interactive 3D map of the Venetian lagoon was developed in collaboration with a small Italian software company specializing in the use of video games for educational and branding purposes, with whom the institution had previously partnered. The idea of employing *Minecraft* stemmed from the intention to capitalize on an audience that was already established on the platform, where content “spreads on its own” (CSH), in contrast to other tools like apps, which require specific infrastructure and greater effort to attract users. Initially, the museum considered a freemium model, with a free basic version of the map and a premium paid “gold version” (HEP) offering advanced challenges and features. However, the software house rejected this option due to insufficient budget, as it would have required integrating an e-commerce platform to manage payments.

The creation of the map involved a collaborative exchange of expertise. The museum contributed in-depth knowledge of the local context, suggested key green practices to be integrated into the gameplay, and supplied reference materials – such as photographs and architectural plans – along with feedback to ensure an accurate digital reconstruction of the city. In turn, the developers contributed the technical infrastructure (e.g., design software and modeling tools) and skills needed to build the virtual environment. Notably, the museum representative mentioned an American development company that collaborated with the software house – a detail the CSH omitted during the interview.

Throughout the campaign, trust emerged as a pivotal element. On one side, the software house was selected due to its strong reputation and the positive outcomes of previous collaborations. The commissioner admitted to not being familiar with *Minecraft* and only knowing the game primarily through their child’s interest in it. This limited familiarity was reflected in the language used – for example, describing the map as a “scenography” (HEP) – and, more broadly, in the persistent stereotype that video games are universally appealing to younger audiences. On the other side, the software company’s capacity to mediate between institutional educational goals and audience entertainment expectations proved essential to the ecogame’s design:

We need to strike a balance: the game has to fit the campaign’s specific goals while still engaging kids with the kind of activities they expect – and learning has to happen along the way. Our job as developers

is to get that balance right. So when I suggest emphasizing fun mechanics over heavily didactic ones, trust me on it – otherwise the map just won't be playable. (CSH)

Beyond faithfully reproducing the urban environment, the map then required engaging gameplay, incorporating challenges that were both educational and enjoyable. The museum and developers identified five core sustainability practices as the framework for player activities, reflecting actionable interventions within the city context: waste system management, adoption of renewable energy, promotion of seasonal local food networks, tourism flow regulation, and mitigation of industrial and vehicular pollution. Through these practices, players accumulate coins for investing in green energy technologies.

Furthermore, effective design of the interactive map required a deep understanding of the platform's affordances and gameplay mechanics. As the CEO of the software house explained:

You need to really understand the platform and know its limits. Sure, you could create educational content in *Fortnite*, but it's tough to make it work with the core gameplay – where you're basically just killing other players. You could build a creative map where players just wander around, but that ends up feeling like chocolate-covered broccoli: no one enjoys it, and it might even backfire. (CSH)

This assessment underscores how platform choice involves more than thematic fit; it requires aligning core mechanics with pedagogical objectives to avoid producing “chocolate-covered broccoli” experiences that feel forced or inauthentic.

Beyond these design considerations, the technical characteristics of *Minecraft* also shaped the production process itself. Since the platform lacks official development tools, the Venice map had to be constructed using third-party modeling software created by community developers outside Mojang – requiring laborious manual and semi-automated building processes, block by block. This approach imposed strict limitations on the project timeline: one month was allocated for conceptualization and approval by the commissioner, followed by three months of realization, during which changes were minimal due to the high complexity and effort required to modify the work.

Additionally, the platform's policies regarding marketplace publication significantly shaped the map's development. To reach a broad audience via the official marketplace, the map was downloadable for free and the museum logo, while featured in the YouTube launch trailer, was deliberately omitted from the playable map to avoid explicit branding – an approach that would have required formal agreements with Mojang and could have jeopardized publication if not approved. To further maximize circulation, the map was also made available as a free downloadable file on external websites popular among players, like *MinecraftMaps.com*.

Following its launch in March 2021, as part of activities promoted by the Municipality of Venice for the anniversary celebration, the campaign was evaluated through map downloads – termed “scientific data” by the HEP – supplemented by press coverage and social media engagement.

Concerning map metrics, the software house – which also handled monitoring – reported 30,000 downloads during the initiative’s active phase, a figure both the company and museum considered a success benchmark. The HEP noted that the project’s substantial cost (approximately two-thirds of the biannual budget) prompted intense scrutiny. The museum director closely monitored download metrics in the early months, “breathing down their neck” (HEP) to ensure accountability and justify the investment to the parent foundation. Additionally, the museum representative acknowledged that impact measurement remained an institutional challenge due to limited resources and a small staff of just 12 employees. Although the software house provided monthly KPI reports during the campaign, these metrics were discontinued once the campaign ended, even though the map remained publicly accessible online.

Regarding the press coverage, 15 articles were recorded, published between March and June 2021, including 2 local newspapers, 2 national newspapers, and 11 online magazines focused on museums and art. The HEP expressed disappointment with the limited national media coverage, noting it fell short of expectations despite significant investment. This was attributed primarily to inadequate allocation of resources to communication, an area acknowledged as “not always simple and not administrators’ strong suit” (HEP). Notably, an additional article appeared in February 2024 on a local family events website, promoting the opportunity to play the map during in-house educational workshops part of the *Edu Craft* program.

On social media, the campaign received only partial attention. On Facebook, the museum’s primary communication channel, only two posts related to the campaign appeared beyond those published by the institutional official account (N=4), both generating no comments and limited likes. These were posted during the campaign active period by a well-known creative writing school and an amateur contemporary art page, respectively.

YouTube content is also very limited: only three videos are available, including the Italian trailer published by the museum (3,100 views) and two by the aforementioned American company – a teaser (17,000 views) and a live stream in English lasting over an hour (151 views). Notably, this teaser contributed most significantly to the campaign’s reach, garnering over five times the views of the official trailer. This disparity may be attributable to the American company’s substantially larger YouTube following (7,500 subscribers) compared to the museum’s channel (794 subscribers). It is also significant that, as of now, the map is only available for purchase on the *Minecraft* Marketplace through the account of the American company, rather than through the museum or the software house.

Discussion

Digital games have increasingly attracted attention as vehicles for environmental communication and sustainability education, with scholarship predominantly examining them as artifacts – analyzing design features, mechanics, and learning outcomes (Fernández Galeote et al., 2025; Georgiou et al., 2023) – or as community sites where

ecological thinking emerges through collaborative play, discourse, and creative reinterpretations of content (Lamerichs, 2024; Werning, 2021). These perspectives, while valuable, have tended to underexplore green activations and, in particular, sustainability campaigns developed by actors external to the gaming industry, who repurpose commercial platforms for their own communicative goals. Within such initiatives, ecogames are not simply pre-designed educational tools but the outcome of complex co-shaping processes among socio-ecological contexts, platform infrastructures, and actors' diverse expertise, resources and aims. Hence, rather than framing green activations as isolated "games for change" instances (Burak & Parker, 2017), this study advances a process-centric framework that foregrounds these reciprocal dynamics.

Building on an existing model (Amadori, 2024) originally applied to high-controversy environmental activism, we refine the framework through a museum-led *Minecraft* campaign in Venice. While both contexts can be understood as communicative processes that articulate socio-ecological issues, stakeholder networks, and media infrastructures, they differ substantially across several dimensions: the actors involved (an NGO and an advertising firm operating on a pro bono basis versus a cultural institution commissioning technical partners within a defined budget), the reasons for mobilization (open contestation of economic interests tied to deforestation versus an institutional campaign oriented toward public engagement and educational outreach), and the structuration of the campaign itself (a grassroots, conflict-driven initiative versus a planned, institutionally governed one). It is precisely this shift in empirical domain that creates an opportunity to identify refinements in the original formulation and introduce the sub-dimensions needed to broaden its scope.

To clarify what is retained and what is reworked, it is useful to briefly recall the core structure of the earlier version, which focused on the interdependencies among ecological controversy, stakeholder networks, and gaming ecosystems (Figure 1). In this model, *controversy* captured the nature of the ecological conflict (for instance, conservationist versus transformative orientations), its perceived social relevance, and its scale. *Campaign network* referred to the motivations and goals of the actors involved, as well as their public reputation. Finally, *video game ecosystem* addressed both the properties and affordances of the game itself (graphics, sounds, code, gameplay, and goals) and the surrounding community of users and streamers, together with the discourses they produce.

Controversy	Campaign network	Video game ecosystem
• Nature (conservationist vs transformative) • Social relevance • Scale	• Motivations and goals • Reputation	• Video game's properties (graphics, sounds, code) and affordances (gameplay and goals) • Community (users and streamers + discourses)

Figure 1 - The original analytical model.

Drawing upon this earlier configuration, the updated framework (Figure 2) introduces more fine-grained analytical subcategories within each dimension: *socio-ecological*

context encompasses geographic and socio-institutional setting, playability translation, and territorial impact assessment; *campaign structure* captures both campaign features and stakeholder configurations; and *video game ecosystem* delineates how ecogame development, availability, and long-term permanence are mediated by platform’s technical affordances, governance policies, and distribution logics. Each of these dimensions is discussed in detail below.

Socio-ecological context	Campaign structure	Video game ecosystem
• Geographic and socio-political setting • Environmental issues addressed • Issue translatability into gameplay • Feedback loops	• <i>Campaign characteristics</i>: objectives, media tools, metrics and evaluation. • <i>Stakeholder network</i>: goals, reputation, expertise, gaming literacy, monetization and ownership	• Platform selection rationales • Game assets and affordances • Platform policies • Community engagement • Ecogame's lifecycle

Figure 2 - The updated analytical model.

Socio-ecological context

The socio-ecological context in which a green activation is embedded shapes its design in three distinct ways. First, the geographic and socio-political setting affects which environmental themes stakeholders deem relevant and communicable. Research indicates that ecogames typically aim to raise awareness, provide understanding, and encourage action, with visible solutions, localized stories, positive framing, and immediate feedback on player decisions serving as effective strategic approaches (Dunlop et al., 2025; Fernández Galeote et al., 2025). Consistent with these principles, the Venice map privileged sustainable urban development practices while addressing climate change as a glocal phenomenon (Gupta et al., 2007). This dual framing reflects how commissioners strategically selected themes to resonate with young local audiences while maintaining broader relevance.

Second, rendering environmental issues playable (Bogost, 2007) requires translating complexity, long time horizons, and diffuse causality (Heneghan et al., 2024) into interactive mechanics. The Venice map implements five types of individual sustainable practices – topics the local administration has promoted for years – that allow players to acquire coins for purchasing green technologies to install throughout the virtual city. While this design may successfully link individual sustainable actions to collective outcomes, its procedural rhetoric (Bogost, 2007) inevitably simplifies ecological relationships by privileging actionable individual behaviors over systemic factors. This framing carries political implications, potentially positioning environmental solutions as matters of personal choice rather than collective structural change (Maniates, 2001).

Third, the territory in which communicative action is intended to have an effect also needs to be considered. While the map’s glocal framing aspired to reach both broad digital audiences and local communities – for instance through on-site museum workshops –

commissioners developed no impact assessment mechanisms. Even at the local level, where direct participant access was guaranteed, no surveys, questionnaires, or follow-up evaluations were implemented. As a result, the campaign strategically selected localized themes seeking territorial impact, yet did not establish mechanisms for assessing local feedback and possible feedback loops.

Campaign structure

Analyzing green activations as structured campaigns requires examining two elements: their characteristics – including objectives, tools, impact measurement – and stakeholder networks – addressing actors’ goals, reputation, expertise, gaming literacy, monetization strategies, and ownership. This dual focus reveals how educational missions often become entangled with institutional and commercial interests.

The “Climate Hero” ecogame was situated within a broader media ecology encompassing social media, institutional websites, and press coverage to increase its visibility and circulation (Consalvo, 2017; Völcker, 2020). Despite the campaign’s educational objectives, success metrics prioritized such paratextual indicators and download counts – which reveal little about actual gameplay experience – over in-game behavioral data or player engagement measures (op de Beke et al., 2024). This emphasis on easily reportable “scientific” metrics, as described by the museum representative, served to justify expenditures to the funding foundation, revealing evaluation practices shaped more by institutional accountability requirements than by pedagogical assessment.

The museum, as a private institution, receives financial support from a local foundation, which relies not only on banking assets and private donations but also competitive national and international grants. In recent years, these have increasingly aligned with the UN’s 2030 Agenda for Sustainable Development Goals (European Commission, 2021). Consequently, green themes – and ecogames by extension – might function as catalysts for securing funding and institutional support rather than stemming from an authentic sustainability mission. This raises questions about the potential volatility of green activations, which could fluctuate according to shifting funding priorities and agenda-setting dynamics, revealing their embeddedness within institutional and financial infrastructures.

Predictably, the stakeholder network is structured around complementary expertise. On the one hand, commissioners provide communication objectives and contextual knowledge but often limited gaming literacy (Gislam et al., 2025) relying on stereotypical imaginaries about games’ inherent youth appeal (Vilasís-Pamos & Pires, 2022) rather than strategic understanding of platform affordances and audience (de la Hera Conde-Pumpido, 2017). On the other, developers mediate between institutional goals, player expectations, and platform constraints (Sotamaa & Svelch, 2021; Consalvo & Paul, 2020), navigating tensions that commissioners may not fully recognize. Crucially, external consultants and subcontractors – such as the American company mentioned above – may contribute technical labor without public acknowledgment, creating opacity in attribution and control.

Monetization dynamics further complicate these configurations. The museum initially considered a freemium model where payment would be optional to unlock enhanced game features, revealing how educational objectives intersect with pragmatic financial considerations, ranging from recouping development costs to potential revenue generation. Such dynamics underscore the hybrid nature of these initiatives, which navigate tensions between public-good missions and commercial imperatives within resource-constrained institutional contexts.

Moreover, the distribution arrangements for commissioned ecogames can evolve in ways that problematize institutional control. In this case, the map – initially made freely available – later appeared as a paid product on the *Minecraft* Marketplace through the American company's account. This shift creates potential asymmetries where commissioners finance development with educational objectives while external partners subsequently control commercial distribution and generate revenue from publicly funded content.

Video game ecosystem

The video game ecosystem dimension reveals how platform selection and subsequent negotiations with its constraints fundamentally influence what forms of sustainability communication become attainable. In this regard, several interconnected elements emerge: platform selection rationales, technical affordances and assets, governance policies regulating content production and distribution, community engagement patterns, and ecogame lifecycles.

Green activations typically orient toward commercial titles based on popularity and established user bases (Werning, 2021). The Venice map was developed on *Minecraft* to leverage youth appeal, reduce infrastructure and audience acquisition costs, and tap into familiar gameplay (Johnson & Woodcock, 2021; Murphy, 2024). However, this strategic choice involved more than audience reach; it meant negotiating the platform's infrastructural conditions. As communication infrastructure (Werning, 2021), *Minecraft* operates as a socio-technical assemblage where technical features, organizational arrangements, and economic interests mutually shape one another (Nieborg & Poell, 2018; Plantin et al., 2018). Its "game logic" (Werning, 2021) – the internal consistency of rule systems – determines how ecological messages can be framed. Without understanding these infrastructural constraints, educational content risks the "chocolate-covered broccoli" effect: poorly integrated pedagogy and play.

Four dynamics illuminate how these conditions shaped the campaign's sustainability communication.

First, *Minecraft* operates as a user-generated content platform enabling external actors to upload custom game worlds. Combined with its crafting affordances, this allowed the development of a customized ecogame functioning as an "applicable simulation" (Dishon & Kafai, 2022) that rendered sustainability issues accessible through goal-oriented gameplay (Gerber et al., 2021; Boncu et al., 2022). However, platform policies also directly constrained

development: prohibitions on automated asset generation extended timelines and increased labor, illustrating how platform rules structure creative work (Sotamaa & Svelch, 2021).

Second, distribution governance influences how the ecogame can be published and promoted. Branding rules directly steer design choices: commissioners omitted the museum logo from the playable map to avoid potential rejection by the platform owner, while including it in the YouTube launch trailer to fulfill institutional branding objectives. Such governance mechanisms compel actors to negotiate their visibility as a prerequisite for platform access, leading them to simultaneously comply with and tactically circumvent platform policies (Thorhauge, 2022; Murphy, 2024; Gillespie, 2018; Caplan & boyd, 2018). Furthermore, by offering the map as a free download on the *Minecraft* Marketplace and external repositories, the project aimed to reach diverse audiences, including children who might not engage with traditional educational programs. However, this approach might reproduce digital divides: children without *Minecraft* access due to financial, technological, or other barriers face exclusion (Livingstone et al., 2025; Tomé Klock et al., 2024). This points to a broader challenge: while commercial platforms offer scale and engagement, they can also reproduce existing social and economic inequalities.

Third, the adoption of popular gaming platforms alone does not guarantee community engagement, a misconception some commissioners may hold (Gislam et al., 2025). In the case examined here, engagement was essentially reduced to counting map downloads and monitoring a small number of social media reactions, while both sustained discussion around the campaign and user-generated content set in the Venice map remained negligible. This underscores a key distinction: making an ecogame available on a popular platform is very different from cultivating an active community around environmental issues.

Fourth, the ecogame's lifecycle reveals how digital artifacts persist beyond initial campaigns with divergent accessibility conditions. Unlike the reference campaign where servers were shut down at conclusion, the Venice map remains available through multiple channels: museum workshops continue providing free access, while simultaneously the map circulates commercially on the *Minecraft* Marketplace under third-party control. This dual availability as a digital artifact complicates impact assessment: the ecogame persists, but its accessibility, pricing, and governance differ across distribution channels, with control distributed among multiple actors whose interests may diverge from original educational objectives.

Conclusions

The urgency of environmental crises has elevated sustainability communication and education on policy agendas, driving growing investment in digital initiatives. Green activations that develop ecogames within commercial gaming platforms represent one such response. While their educational potential merits acknowledgment (Soriani et al., 2026) – particularly in light of enduring moral panics around video games (Ferguson, 2017) – it remains crucial to examine how platform-specific constraints interact with stakeholders'

strategic choices in navigating them, thereby shaping environmental messaging. This contribution challenges techno-solutionist rhetoric – often conveyed by platform owners who position gaming as inherently effective for sustainability education⁸ – by problematizing the tensions, trade-offs, and asymmetries that determine which forms of environmental communication become viable within such environments (Pötzsch et al., 2024; Werning, 2021; Chia et al., 2020).

To address these dynamics, the study advances a process-centric analytical framework that examines how socio-ecological contexts, campaign structures, and video game ecosystems co-shape ecogame development within existing platforms. The “Climate Hero” case anchors this framework empirically, illustrating how its three dimensions intersect. The socio-ecological context highlights the friction of translating place-based environmental issues into playable mechanics, a process that risks reducing systemic climate challenges into actionable, individual behaviors. This pedagogical simplification is compounded by the campaign structure, which reveals how resource-constrained institutions may prioritize funder accountability – measured via downloads and media coverage – over meaningful learning assessment. Finally, the video game ecosystem demonstrates that platform infrastructures are not neutral conduits: Minecraft’s stringent branding rules, marketplace governance, and distribution channels governed the map’s design and ultimately facilitated its transition into a paid product managed by a third-party partner. This trajectory also raises broader concerns about equity, as monetization and pay-to-access barriers may exclude disadvantaged children from accessing environmental education, a paradox that sits at the heart of deploying public-interest campaigns within commercial platforms.

Beyond illuminating this specific case, the analysis yields theoretical implications that clarify the core strategic dilemma of green activations: repurposing commercial titles versus developing purpose-designed serious games on dedicated infrastructures. Commercial platforms provide large, ready-made audiences and low distribution costs, but impose structural limitations through content guidelines and algorithmic curation that constrain pedagogical ambitions or narrow the range of communicable environmental messages. Purpose-built infrastructures offer greater control over design and learning outcomes, yet entail higher financial demands and require external partnerships to secure visibility, such as with mission-aligned streamers or content creators (Denicolai & Domenici, 2023). Platform selection further raises a “sustainability paradox” (Abraham, 2022), as energy-intensive gaming hardware and networked infrastructures may contradict the ecological values promoted. Therefore, green activations should be conceptualized not merely as “games for change”, but as platform-mediated communication campaigns whose possibilities are deeply embedded in, and constrained by, commercial infrastructures and organizational arrangements.

By illuminating these dynamics, the framework supports a more reflexive approach to the design and deployment of ecogames within commercial platforms. However, its current formulation remains grounded in stakeholder perspectives and a limited number of cases centered on the same platform, which may affect its transferability. Future research should

therefore apply it comparatively across diverse institutional types, platform ecosystems, environmental themes, and geographic contexts. Integrating player-centered methods – such as gameplay observation, interviews, and longitudinal learning assessments – would further consolidate the model’s analytical capacity and enable more systematic investigation of audience engagement and educational impact, supporting both the critical appraisal of existing green activations and the informed design of future ones.

Biographical Note

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Notes

¹ Games designed and developed for purposes beyond entertainment.

² Minecraft is a three-dimensional sandbox video game – i.e. games providing open-world environments without following predetermined objectives or narratives – in which players explore block-based worlds, gathering resources and combining them to build structures, objects, and systems. The game offers two primary modes: “Survival”, in which players must manage health, hunger, and resources while fending off hostile creatures, and “Creative”, in which all resources are available without limitations and threats are absent. This open-ended design has made Minecraft a widely used environment for educational projects with children, who can experiment with construction, problem-solving, and collaborative play within familiar and accessible mechanics.

³ Such as “Angry Birds Champions for Earth”, a tournament in *Angry Birds Friends* (Rovio Entertainment Ltd., 2015) held during Climate Week 2015 in collaboration with the United Nations.

⁴ Sandbox games provide players with open-world environments and tools to explore, build, and create freely, without following predetermined objectives or narratives.

⁵ Mods (modifications) are user-created alterations to a game’s code or content that modify gameplay or introduce new mechanics (Werning, 2021).

⁶ The supplementary materials surrounding games such as trailers, promotional posts, media coverage, and community discussions that frame how games are understood and valued.

⁷ Incorporating audience perspectives to more effectively gauge campaign reception was initially considered. However, several practical constraints prevented systematic engagement with the ecogame’s players. Since users accessed the Venice map without any centralized registration system, identifying or reaching individual players proved unfeasible. Although the museum had integrated the map into on-site workshops, no data collection protocols had been established at the time, and retrospective recruitment was ruled out given the time elapsed since the campaign’s launch in 2021.

⁸ For example, Microsoft states that *Minecraft* “empowers students to solve climate issues” and creates “pathways to new, green-economy careers” (Microsoft, 2022), generalized claims that overlook how contexts of use and player characteristics fundamentally shape engagement, meaning-making, and learning outcomes.