Navigating Physical and Digital Environments: Latin American Video Game Studies in Practice

PAUL R. MERCHANT
University of Bristol, UK

THEA PITMAN
University of Leeds, UK

EDWARD KING
University of Bristol, UK

This article reflects on developments in research into Latin American video games two decades after the first studies in the field. In particular, it fills a gap in research by reflecting on the pedagogical uses of video games, focusing both on their value in the undergraduate classroom and on the design of educational games for use by school children, asking to what extent games might afford their players impactful embodied experiences and ways of navigating complex systems of information and power. The case studies centre on the teaching of environmental humanities and digital literacy in a specifically Latin American context.

Keywords: computer games, digital literacy, environmental humanities, Latin America, pedagogy, video games.

Introduction (Paul R. Merchant)

Ten years have passed since Phillip Penix-Tadsen published an article calling for the development of a 'Latin American ludology', arguing that 'it represents an attempt to understand who we are as a field, how our area of research functions, and what we want it to become' (Penix-Tadsen, 2013: 185). Both when issuing this call and in his subsequent writing, Penix-Tadsen draws attention to the influence of the Uruguayan game designer and analyst Gonzalo Frasca in promoting 'ludology' as a medium-specific methodology for the study of video games, in order to recognise the complex intertwining of narrative structures, visual design and player agency, among other elements, in the construction of signification (Penix-Tadsen, 2015: 206–7). Luis Sebastián Ramón Rossi, in his mapping of studies of video games in Spain and Latin America, also cites Frasca when arguing that Spanish and Latin American researchers were ahead of their Anglophone counterparts in establishing an ontological difference between video games and purely narrative formations (Rossi, 2018: 152). Frasca has also been influential in the international field of game studies. For example, both his game *September 12: A Toy World* Frasca, 2003) and his critical writing on the subject, such as 'Videogames of the Oppressed' (2004), are cited prominently in relation to 'critical video game design' in Mary Flanagan's *Critical Play: Radical Game Design* (2009).

Indeed, Penix-Tadsen's provocation seemingly glosses over some of the history of studies of video games in Latin America. For María Luján Oulton and Diego Maté, this history can be traced back to

the early years of the twenty-first century (Oulton and Maté, 2023: 12). One of the earliest issues of the journal *Game Studies*, from 2002, contains an article that examines the Latin American games industry through a 'cultural industries' lens (Lugo, Sampson and Lossada, 2002). A 2020 piece by Maté, meanwhile, dates the beginnings of Argentine discussions of online gaming back to 2009 (Maté, 2020: 28). In this light, Penix-Tadsen's (2013) intervention might appear as an indication of the risk of non-Latin American and/or non-Latin America-based scholars defining a 'Latin American' perspective in overly stark or confident terms.

With that risk in mind, this article argues that the study of video games and gaming in Latin America might be framed less in terms of a specifically Latin American 'ludology' and more as a form of analysis that is attentive to the articulation and interaction of spaces and locations (whether symbolic, virtual or physical). Indeed, an imperfect summary of an emerging critical consensus in the field would be that video games can both produce and critically interrogate forms of agency and intersubjective relations, both among humans, and between humans and non-human others and their environments. Recent developments in Latin American video game studies point us in this direction.

Debates have ensued, for instance, over the extent to which games replicate the logics of coloniality and racial violence that characterise the lived experience of many (e.g., Llamas-Rodriguez, 2021), or, conversely, how their 'procedural rhetoric', to use Ian Bogost's influential term, might generate subversive senses of affinity in the player, for instance with cross-border migrants between Mexico and the United States (Cleger, 2015). This kind of discussion is consonant with a broader trend in what Bjarke Liboriussen and Paul Martin (2016) term 'regional game studies': an exploration of how games mediate between (often unequal) global and local contexts while endeavouring to avoid replicating simplistic postcolonial centre-periphery models of power and influence. In a parallel development, alongside sociological studies of gamers and gaming culture (e.g. Rosales Peralta, 2014), considerable critical attention has been paid to how video games, particularly those produced by large commercial studios located outside of Latin America, construct a spatial imaginary of the region. Penix-Tadsen's *Cultural Code: Video Games and Latin America* (2016) is of course a significant point of reference in this regard.

In short, there is now broad recognition that video games in Latin America, and in the Global South more generally, articulate identity and intersubjective relations in complex ways. One might think, for example, of the reinterpretations of Japanese culture in gamer and *otaku* subcultures in Latin America and the resulting patterns of behaviour in virtual and physical spaces (see also Apperley, 2019; Penix-Tadsen, 2019). Furthermore, while the stereotypes of the gamer and the *otaku* are often presented as a young man who barely ventures outdoors, the boom in mobile gaming and augmented reality (AR) technology has challenged such assumptions, with respect to the spaces and the demographics of gaming (see, for instance, Eklund, 2016, on the large proportion of women among 'casual gamers'). A study of the use of the mobile AR game *Pokémon Go* in Santiago de Chile in 2016, for example, showed an increase of up to 13.8 per cent in people spending time outside at certain times of day (Graells-Garrido et al., 2017). In September 2019, some three years after the game's release, I was surprised to come across a large gathering of young people, some 200 or so, both male and female, in the Parque Forestal in the centre of Santiago. It soon became apparent that they were not just out for a walk, or cycling or rollerblading as others were, but were instead tracking down a rare Pokémon that had appeared in that location. Here, then, is an example of how engagement with a massively popular Japanese cultural franchise reshaped some young people's experience of their local environs.

The example of a mobile game like *Pokémon Go* also points to the fact that as games become available across an ever-increasing variety of platforms, in both authorised and pirated versions, they become harder to pin down as an object of study. Hence, the branching of studies of video games into sub-fields: to name two examples from Brazil alone, we might think of Tarcízio Macedo and Thiago Falcão's work on e-sports (2019) and José Messias' writing on game piracy and decolonial epistemologies (Messias, 2015). Meanwhile Luis Wong's recently published monograph, *América Latina juega: historia del videojuego latinoamericano* (2022), complete with a foreword by Gonzalo Frasca, approaches the topic from an industry perspective, via interviews with game developers and other insiders.

This article aims to embrace that formal instability, viewing contemporary Latin American video games as a kind of disciplinary boundary object. Given that they constantly mediate and question forms

of space, subjectivity and power, it is hardly surprising that video games have become a medium of considerable interest to interdisciplinary fields such as environmental humanities and digital humanities, including where they intersect with Latin American studies. Latin American culture is a particularly productive terrain for investigating these forms of agency and inter-subjectivity, in part not only due to the rich history of critical thought on these topics (going back at least to Beatriz Sarlo's work in *Escenas de la vida posmoderna*, 1994) but also because issues such as environmental degradation and inequities in access to reliable information are so stark in the region.

This article asks to what extent games might teach their players ways of navigating such complex systems of information and power. Methodologically, it seeks to balance a critical, as well as personal, review of the field of research into Latin American video games as a whole, with practice-based reflections on the pedagogical applications of this kind of cultural production in the undergraduate classroom, as well as a practice-based study of the design of a video game for pedagogical purposes. In other words, our case studies share a particular focus on educational contexts and on embodied pedagogical practice. This includes the importance of play, and we thus take seriously the notion that the meaning of video games is constructed and accessed *through play* (to return to one of Penix-Tadsen's provocations from 2013).

Moving on, therefore, from work that takes Latin American video games as its object of study, what we propose to do in what follows is offer some reflections on how the affordances of video games can provide us with new pedagogical approaches within the classroom and how our research into video games can also evolve into the field of serious game design, ultimately aiming to achieve wider pedagogical impact. While, as Latin Americanists, our choice of case studies and the contexts for game design remain focused on Latin America (as well as Latinx contexts in North America), we hope that the issues that we are grappling with here are of use to those interested in both studying and teaching in relation to environmental change and digital literacy in more general terms.

This article stems from a series of conversations between the three authors around their shared interest in video games. Paul R. Merchant has written the introduction you have just read, as well as the conclusion, Thea Pitman has written the section on teaching environmental humanities with video games and Edward King has written the section on designing educational video games for digital literacy. Each of the sections indicates the name of the author who has drafted it and the use of the first-person singular in each section corresponds to that individual author. Use of the first-person plural in the introduction and conclusion indicates our collective voice.

Teaching Environmental Humanities with Video Games (Thea Pitman)

The literature on using video games for pedagogical purposes, particularly at primary and secondary school level, is already vast, ranging from discussions of the potential (or dangers!) of digital 'gamification' of traditional teaching materials, to the design of educational video games per se, to the ways in which massively popular video games may be exploited in the classroom, to the study of video games as a subject in their own right, and it is not within the scope of this article to even attempt a literature review of the whole of this field (see Luzardo et al., 2019; Hartman, 2021; Rüth, 2021; León-Atiencia et al., 2020; Villers and Hernández Trujillo, 2022). Suffice it to say that in what follows I will focus solely on the question of how video games of a variety of different sorts – persuasive/serious games, art games, 'triple A' entertainment games, casual games, pervasive games and the array of different hardware and software that facilitate their use – may be used in the undergraduate arts and humanities classroom for the purpose of teaching environmental humanities.

The potential of video games for environmental education is a key topic within the literature on the pedagogical uses of the medium (see Condis, 2015; Wu and Lee, 2015; Moreno-Cadavid, Vahos-Mesa and Mazo-Muñoz, 2019; Ortiz, Trelles and Ortiz, 2019; Lawrence and Sherry, 2021; Pérez Arriaga et al., 2022). There is also a fast-growing body of literature dedicated to examining the relationships evidenced through the narrative, aesthetic and ludological features of games with questions of ecology and environment, including a particular interest in what have come to be known as green, environmentalist or climate change games. This work can suggest a wealth of case studies and ecocritical frameworks, including an ecocritical approach to the video games industry as a whole, that

may inform classroom practice (see Swanstrom, 2016; Backe, 2017; Nguyen, 2017; Chang, 2019; Navarro-Remesal, 2019; Clapper, 2021; Abraham, 2022; Miner, 2022 and, in a specifically Latin American context, Woolbright and Oliveira, 2016). Indeed, the educational potential of video games in this regard is thought to be such that the United Nations Development Programme has recently made its own game to advance its agenda in relation to climate action – *Mission 1.5* (2020) – as well as set up the Playing for the Planet Alliance with its annual Green Game Jams designed to promote more widespread engagement with the issue among major players in the videogame industry ('Video Games for Climate Action', 2022).

Debates in the field revolve around what is specific about video games that makes them so suitable for environmental education, what types of video games might be best suited to the task, and the more pragmatic aspects of how they may be used in the classroom. With regard to the properties of video games that make them suitable for environmental education, critics flag the impact that embodied, first-hand engagement with a topic (via role play and interactive simulations, for example), contextualised in a specific game world or 'environment' with its own set of rules, can have on encouraging empathy with other perspectives (including non-human ones), imagining other (more sustainable) futures and achieving higher-level learning objectives such as critical thinking and possibly also behaviour change. As Megan Condis observes:

> … video games are ideally suited for the environmental humanities classroom because they provide students with alternative environments and subjectivities to inhabit […] Video games teach students to detect, navigate, and manipulate systems, both those that represent and reflect our actual world and those that posit imagined alternative worlds. […] From here it is but a short cognitive leap to get them thinking about how the construction of nature across a variety of discourses shapes both individual and institutional practices. (Condis, 2015: 90-92)

Nonetheless, Abraham (2022, Ch. 2) suggests a far greater degree of scepticism than most about the possibility for behaviour change due to the sheer heterogeneity of players and their ways of engaging with games and the lack of concrete evidence of such a thing happening. Instead, he prefers to focus on challenging the gaming industry to change to a more sustainable modus operandi at a macro level, leaving the micro level of individual behaviour patterns to follow suit.

As for which types of video games work best, while a lot of attention understandably is paid to serious games whose objective is to educate and persuade the player of issues such as degrowth or stewardship of natural resources, critics such as Condis (2015), Woolbright and Oliveira (2016), Backe (2017) and Abraham (2022) all underscore the value that may be derived from using all sorts of different games in classroom environments, even those whose primary *raison d'être* is entertainment. After all, examples do not always have to be 'good', and developing critical thinking skills with respect to games that rely on unsustainable environmental models such as resource extraction is a learning objective in itself. Wu and Lee also consider the potential that more recent mobile and locative technologies have for developing serious games that are 'pervasive'; that is to say, instead of functioning as a space apart where players develop knowledge and skills suitable 'for future action', in pervasive games, real and game worlds are combined and opportunities are provided for 'concrete action as part of the game experience' (Wu and Lee, 2015: 415) itself. On this basis, they consider pervasive games to be potentially more impactful in the context of environmental education than other types of video games.

With respect to the more pragmatic aspects of teaching with video games, Wu and Lee (2015) flag the importance of thinking through facilitation and debriefing. In their discussion of facilitation, the question of students' level of literacy with video game mechanics and their innate affinity for video games is taken for granted and the key issue to resolve is how access to the games will be achieved in the classroom environment and at scale. In terms of debriefing, teachers may decide to opt for a very hands-off approach and hope that students' innate affinity for playing video games will lead directly to deep learning, acquired almost subconsciously and without the teacher having to make their objectives explicit. A hands-off approach can also be adopted if the video game is specifically pedagogical in design and takes the place of the teacher in the classroom. Alternatively, teachers may want to give students a more explicit reason for playing video games at the outset, and an opportunity for discussion

after doing so, in order to ensure that learning objectives, especially those involving higher-level critical thinking skills, have been achieved. I will return to all these aspects in my consideration of my own practice in what follows.

In the academic year 2022–2023, I started teaching a four-week, six-contact-hour 'unit' for a second-year undergraduate module entitled 'Global Environmental Humanities'. This module is available to a wide cross-section of students in the School of Languages, Cultures and Societies at the University of Leeds and aims to explore the 'ways in which humans have responded, and are responding, to the environment in which they live through diverse forms of cultural expression' (for the full catalogue entry, see https://webprod3.leeds.ac.uk/catalogue/dynmodules.asp?Y=202223&M=MODL -2075). My unit aims to approach the topic from the field of digital culture studies, exploring creative digital responses to environmental issues, including those caused by digital technologies themselves. The overriding purpose is not to teach students to save the planet per se, but to enhance their ecocritical thinking skills when examining digital art forms, including video games, to better understand how they might work to influence their audiences.

As a Latin Americanist, I draw on a range of Latin American and Latinx examples of digital cultural production where such works either have no specific human language requirements or exist with an English-language version to accommodate those students who are studying languages other than Spanish or Portuguese. In the case of video games, this is not a particularly limiting factor as many are launched with multiple language options. I confess that my selection of video games thus far has been heavily influenced by my main research interest in electronic literature and digital media arts more generally – they are all art games, and they are also all 'green games', made with a specific environmentalist aim in mind. However, the skills acquired will be the same and students are encouraged to apply what they learn from examples studied in class to other examples with which they are more familiar.

In terms of classroom practice, while I can take for granted the fact that my students are familiar with standard game mechanics, the kind of person who opts to study a languages or more broadly arts and humanities-based degree programme does not necessarily hail from a keen gamer demographic, and hence debriefing – the reason why I'm asking them to play video games – needs to be made explicit. To guide their thoughts while they play the games I select for class, I ask them to use the set of questions proposed by Hans-Joachim Backe (2017) in his 'ecocritical framework for digital game history':

> One: Is the natural environment engaged with semiotically – that is, audiovisually and discursively – as well as ludically? […] Two: Do the three modes of engagement with ecological questions [ie. audiovisual, discursive and ludic] cohere or create friction? […] Three: Is the treatment of ecological topics explicit and central or rather implicit and peripheral? […] Four: Is the treatment of 'nature' specific and informed? […] Five: Are games mechanics or semantics anthropocentric, or do they offer alternative perspectives? […] Six: Is the treatment of ecological topics affirmative, critical, or ironical? (Backe, 2017: 47–48)

And to wrap things up, we consider what kind of an audience might get most out of the game being played. My students are generally reluctant to part with money to access digital materials required for class which limits my use of commercial games and steers us more firmly towards using art and other serious games, which are most often free.

University classrooms are not ideally set up for playing video games, no matter how well-equipped with modern technologies they are. This rules out any games that are made solely for games consoles. However, my students all tend to come to class with a laptop/tablet, and almost invariably with a mobile phone as well, all of which will have internet access. This means that free browser games are the easiest to facilitate as students need part with no money, and no software needs to be downloaded either: students can share laptops/tablets if necessary and all they need to get started is the game's URL.

Games available as free mobile phone apps can work well given the number of phones in the classroom, and are worth trying in and of themselves, given Wu and Lee's (2015) positive assessment of the potential of pervasive games. Nonetheless, some students will be reluctant to clutter their phone's memory with extra apps, whether they are free or not, and not all games will exist in both Android and

Figure 1. Eugenio Tisselli, *La Puerta/The Gate* (2017). Screenshot: Thea Pitman.
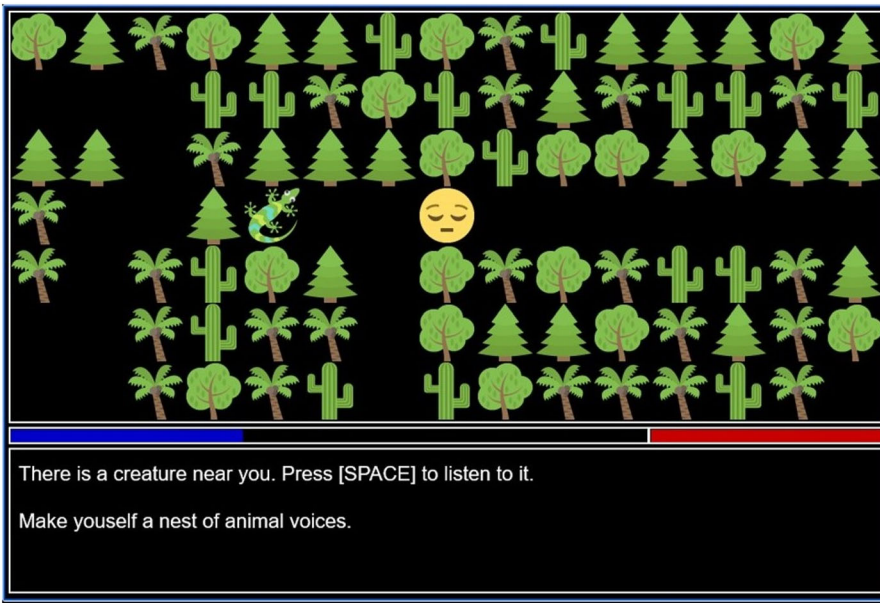
Source: https://motorhueso.itch.io/the-gate

iOS versions thus limiting the number of suitable devices in the classroom. My solution here is to find a way to provide a limited supply of suitable devices of my own. While letting students wander off with one's mobile phone is far from recommendable, accumulating and reusing cast-off (but not broken!) mobiles and tablets can work. This, however, raises another red flag that is inherent to teaching with this kind of material: the built-in obsolescence of all hardware and software. My suspicion is that I will need to rethink which games I use each year to address this.

For the academic year 2022–2023, I used two games in class. The first is a free, single-player browser game called *La Puerta/The Gate* (Tisselli, 2017) made by Mexican programmer-writer and researcher Eugenio Tisselli, available to play in both Spanish and English (Figure 1). This is a very simple 2D survival game where you have to explore a forest game environment, learning the languages of various animals that you encounter as you go to pass through the gate of the title. If you do not do this fast enough, your environment overheats, and it is game over. After a 20-minute lecture about video games and environmental questions, that includes introducing Backe's ecocritical framework, I invite students to spend 15–20 minutes playing *La Puerta*, either alone or with a classmate looking over their shoulder where there are not enough laptops to go round. In the discussion session that follows, we explore the way the game works discursively (not just the topic and objective but also the way it deliberately references key theory in this field, such as Donna Haraway's *Staying with the Trouble: Making Kin in the Chthulucene*, 2016 and Timothy Morton's *Being Ecological*, 2018), aesthetically (animal icons disappear from the screen to indicate extinction; the background screen colour turns slowly from black to red as the forest overheats, for example), and ludically, in terms of game mechanics (the time pressure of gameplay enhances the sense of urgency related to climate change, for example). We then move on to consider Backe's more advanced questions, noting how the game can be said to encourage the development of deep understanding and care in relationships between human and non-human animals by forcing players to learn to listen to the languages, and hence perspectives, of non-human animals, to survive, all the while not abandoning an anthropocentric perspective entirely (the player avatar is an emoji-like face that evidences emotions as the game progresses).

The second game is *Sin Sol/No Sun* (2020), made by Latina media and performance artist Micha Cárdenas and her team at the University of California, Santa Cruz. *Sin Sol* is a single-player game

app for iPhone and iPad (available on the App Store at a cost of US$ 2.99) that uses Augmented Reality to layer the digital content of the game over the player's real surroundings. This is very much an example of 'slow gaming' where there is little in terms of traditional game mechanics and no way to 'win' – instead the 'player' needs to explore the digital materials to piece together poetic fragments of a narrative (in English) that references the main protagonist's experience of how the planet died some fifty years previously, paying particular attention to the additional vulnerabilities that certain demographics experience with relation to climate change. Despite the obvious technological challenges that this format of game poses, I concur with Wu and Lee's (2015) argument that more pervasive gaming formats present an important opportunity for impactful learning in this field, so I facilitate playing the game in class by providing students with the necessary iPads/iPhones myself and asking them to play the game in small groups. The way the game works is that it makes the player move around physically to explore the digital content, and it requires such a large amount of space that very few indoor spaces, and certainly not a standard classroom, will suffice. The player thus has to go outside and explore their own environment, whatever that might be, and it provides a novel way of seeing one's own environment afresh as it is framed through the lens of the climate change narrative in the digital layer of the game (for more in-depth ecocritical readings of *Sin Sol*, see Casalini, 2021 and Pitman, 2023). Given the fact that this is the second game that we play in class, I give less explicit instructions in advance. This also means that students get to respond to the way the game works more intuitively, thus hopefully facilitating a more embodied, visceral form of learning. I have a strong sense that the learning objectives of the session are being met when I have lost all my students … The fact that with both Tisselli's *La Puerta* and even more so with *Sin Sol*, students have to work together to play the games because of the availability of devices is, I think, a fortuitous positive in that students discuss the game together as the take turns to play it. As and when my roving students return to the classroom and hopefully return my devices, much of the necessary debriefing has already happened.

In conclusion, I found that the two video games selected worked very well to introduce students to an ecocritical reading of green games. For future years, it would be interesting to be able to include some more commercial examples, and if I were to stray just a little bit from my Latin/x American remit, I would be very interested to include Indigenous environmentalist games such as Elizabeth LaPensée's *Thunderbird Strike* (2017), as well as video games such as Molleindustria's *Phone Story* (2011) that include within them a direct critique of the enormous environmental impact of digital technologies and the videogame industry itself (for an in-depth reading of *Thunderbird Strike*, see Clapper, 2021 and Miner, 2022, and for *Phone Story*, see Nguyen, 2017 and Navarro-Remesal, 2019).

Designing Educational Video Games for Digital Literacy (Edward King)

You get back from school and log onto your computer to check your messages. Magra Luz, an avatar of the AI system Zap Eden, appears in the corner of the screen to curate your online experience. After a reminder from your friend Zé Pedrinho on the messaging app Zip Zap, you get to work on a collaborative piece of homework – carrying out internet research on issues around urbanisation in contemporary Brazil. You consider asking Magra Luz to compile it for you but decide to do it yourself and get to work, instinctively finding sources you think are 'legit' and moving on. Just as you download a file sent by Zé, your computer glitches out for a moment and you receive a message through Zip Zap from an unknown entity calling herself Xikoh. You have been warned at school not to reply to messages from strangers. But curiosity gets the better of you; so you respond. She is a member of a media activist group calling from the future – from the year 2068. Xikoh and her allies are mounting a resistance to the totalising control of information by the Zap Eden corporation and have identified 2023 as a crucial moment in the history of the digital age, when Big Tech platforms consolidated their grip on the internet. Xikoh is asking for help to carry out research into the history of media activism and unearth alternative visions of what the internet could have been and perhaps, if they are successful, still could be. But can you help Xikoh before Zap Eden installs its new all-consuming software system? Can you even trust Xikoh? Can you save the Internet before it is too late?

This is the premise of *Futurecall* (Figure 2), a video game developed in collaboration between the University of Bristol, the São Paulo-based creative team Cachalote Produções, led by comics artist

Figure 2.   Detail from *Futurecall*: selfie by Xikoh. Screenshot: Edward King.

Source: https://www.aocagamelab.games/futurecall/

Rafael Coutinho, and Aoca Games lab in Bahia. The idea sprang from a series of conversations between myself, Rafael and Felipe Fonseca, one of the cofounders of the media activist network Metareciclagem, around creative approaches to the challenges of digital literacy and the urgent need to revisit the lessons learnt from the digital inclusion initiatives funded by the first Lula government from 2003 to 2010. We decided to commission a series of interviews with the leaders of non-profit organisations running digital inclusion and community technology projects across Brazil that would form the basis of a report summarising the challenges they face and their key priorities in the coming years. The report, titled ID21 (Instituto Neos, 2021), provided the inspiration and conceptual background for the production of the video game, which we conceived of as a critical media literacy tool that the organisations contributing to the report would ultimately use in their workshops and digital inclusion activities. In January 2023, we completed a demo of *Futurecall* which, at the time of writing, we are testing with potential users.

Futurecall has two main aims. First, by obliging players to piece together narratives between the competing demands of Xikoh and Magra Luz, the game raises awareness among its target audience (school-age children) about the dangers of fake news and misinformation online. Second, by employing a science fiction narrative and placing the current state of networked communication within a longer history of media activism, it critically estranges players from the current state of the internet and its increasing dominance by Big Tech platforms. Its originality derives from the combination of these two aims, which avoids one of the main pitfalls of most existing campaigns against fake news, which is to place the burden on the actions of individuals to both identify and avoid circulating potential disinformation.

A number of recent projects have gamified education around the spread of disinformation on social media. For example, *Bad News*, which was created by the University of Cambridge in 2018, is an online browser game in which players occupy the perspective of a 'fake news tycoon' and try to increase their influence (and number of followers) by uploading sensationalistic posts to Twitter and creating fake accounts for celebrities and politicians. In another example, the board game *Vamos aos Fatos*, developed by researchers at the University of Brasília in 2022, obliges players to become detectives who must disentangle the true from the false. In both examples, the main message is 'think before you post,' locating responsibility for resolving the disinformation crisis with individual actions. *Futurecall* takes

a different approach by placing the phenomenon of fake news within the broader digital ecosystem relating to disinformation.

To achieve these aims, *Futurecall* mobilises some of the key affordances of video games. The power specific to political or 'persuasive' video games, Ian Bogost (2007) has argued, lies in what he calls 'procedural rhetoric', their potential to critically examine political systems and ideologies not just by addressing them at the levels of plot, characterisation and imagery but also by emulating the processes that drive them through the logic of gameplay. *Bad News* maps quite neatly onto this strategy. Its players are not only exposed to a representation of a spreader of fake news but, in the gameplay, they also occupy the perspective of fake news spreaders and become a part of the mechanics of disinformation. This allows them to see 'under the hood' of the whole process. James Paul Gee employs a similar argument when identifying the specific value of using video games for education. Video games, he argues, 'can induce 'embodied empathy for a complex system' where a person seeks to participate in and within a system, all the while seeing and thinking of it as a system and not just local or random events' (Gee, 2006: 173). *Futurecall* employs a similar strategy to those outlined by both Bogost and Gee by placing the player within the process of disinformation, from the perspective of a 'consumer' of fake news rather than a producer or spreader (as is the case with *Bad News*). Furthermore, the game confronts the player with the broader 'system' of fake news by placing the phenomenon within a narrative about possible future developments of Big Tech platforms.

Futurecall, however, differs from *Bad News* and Bogost's account of 'procedural rhetoric' by placing the focus on player agency. The player occupies a position in the gameplay in which their agency is very explicitly shared with Zap Eden's AI system Magra Luz. They can only carry out actions when they are sanctioned by this system. The AI intervenes, for example, when the player interacts with an unrecognised user on the chat application. Both the overarching narrative and the player's goals within the game emphasise the question of agency in relation to technological systems. The aim of Xikoh's resistance movement, which the player must support, is to resist control over communication and information flow by the Zap Eden corporation. The logic behind travelling back in time to enlist the help of the player is that the temporal present of the gameplay is a historical moment in which the agency of internet users has not been completely circumscribed and therefore change is still possible. At every step of the way, the player is forced to confront the limitations of agency, both their own and that of the other avatars in the game. For example, it is never completely clear whether Xikoh really is a resistance fighter from the future or another AI programmed to disrupt Zap Eden's software system.

In this respect, *Futurecall* mobilises what Nguyen argues is one of the defining characteristics of video games: its potential to communicate different forms of agency. Nguyen points out that, by constructing a set of goals and imposing restrictions on gameplay, game designers 'craft both a temporary practical agency for us to inhabit and a practical environment for us to struggle against' (Nguyen, 2020: 17). In playing a game, they go on, '[w]e give ourselves over to different – and focused – ways of inhabiting agency', different modes of interacting with and being able to affect the world. At a fundamental level, therefore, 'the medium of the game designer is agency' (Nguyen, 2020, 17). *Futurecall* sets out to explore some of the implications of this for education. Rather than equip players with new digital literacy skills (the ability to discern fake news from real, for example), the game creates the conditions in which the player experiences the particular type of curtailed agency that emerges through the mediation of automated computer systems. *Futurecall* presents the phenomenon of misinformation as a symptom of the shifting balance of agency between humans and software systems. In the spread of fake news, the logic of networked information on social media platforms – in which popularity (defined by 'likes' and shares) increases visibility, which in turns increases the chances of popularity – takes precedence over the content of the information. This logic and its need for content that gains traction determine the nature of the content and define the parameters of the agency of its creators. By inhabiting a shared form of agency with an AI system, the player of *Futurecall* is encouraged to engage with the underlying system behind fake news and think critically about it.

Another strategy for turning the player's attention to these emerging forms of shared agency is the use of glitch aesthetics. The term 'glitch' is used to refer to moments when technological systems break down. Artists, such as Rosa Menkman, have seized on these instances of failure or error to reveal unexpected moments of beauty or expose underlying infrastructures and the hidden truths of socio-technological systems. The 'practical environment' (to use Nguyen's term) that the player

of *Futurecall* inhabits is a stylised version of a standard laptop or desktop Windows home screen, rendered in a pixelated aesthetic. In a prologue sequence, the player becomes acquainted with this environment, its affordances and constraints, by answering messages from friends on Zip Zap and carrying out simple homework tasks, following guidance by Magra Luz. Suddenly, the screen freezes and the player's ability to interact with the environment is suspended. Once normality has been resumed, Xikoh appears in the Zip Zap chat requesting help. Legacy Russell (2020) has argued that glitch constitutes a form of blockage (through the breakdown of software systems, for instance) that paradoxically constitutes a form of movement (the term has etymological connections with 'sliding' and 'slipping') that opens up the possibility of change. Glitch 'creates a fissure within which new possibilities of being become manifest.' The aestheticised glitches in *Futurecall* introduce this double movement between blockage and movement into the gameplay. On the one hand, the glitches block player progression by temporarily suspending their actions. But on the other hand, they announce a temporal rift that puts the player in touch with Xikoh who both reveals the underlying power dynamics of the software environment and evokes the possibility of developing alternatives.

Aubrey Anable (2018) argues that an aesthetics of failure is one of the defining characteristics of what she identifies as 'artists' games.' This aesthetics, which is exemplified by games such as *Let's Play* and *Snek* by Pippin Barr, is characterised by 'pixelated and low-resolution graphics, game mechanics that have difficult or awkward controls, the removal of the fantasies of control and mastery [which] disrupt[s] the algorithmic and affective trajectories of winning and losing' (Anable, 2018: 104). By 'playfully disrupting the sensual experience of gameplay' they 'renegotiate our affective relationship to these devices that we are accustomed to using absentmindedly' (Anable, 114). The restriction of actions by Magra Luz and the suspension of agency by Xikoh's glitch both have the effect of estranging the player's affective relationship with the platforms of misinformation. This feeling of 'failure' is all the more acute considering the proximity of *Futurecall*'s game environment to the software systems that players rely upon in their everyday lives.

The other main function of the glitch in *Futurecall* is to suspend normal temporalities. Its appearance announces a temporal fracture that allows Xikoh to travel back in time to enlist the help of the player. As such, it is a narrative device for introducing one of the game's key educational strategies, which is to place the phenomenon of misinformation in the historical context of the development of Big Tech platforms and their control over the traffic of information. This involves both a future-looking speculative dimension and a retrospective archival tactic. The science fiction plotline speculates about what the future might look like if we continue on our current trajectory. Xikoh's plan, meanwhile, is to dig through the archives of media activism in Brazil in a search for possible alternatives to this dystopian prospect. The player carries out research on Xikoh's behalf and, in the process, learns about some of this history. In this respect, *Futurecall* functions as an archive or what Sky LaRell Anderson describes as an 'interactive museum.' Anderson argues that educational video games can 'avoid the pitfalls of traditional learning games' by combining elements of world building with 'affective game design aesthetics' (Anderson, 2019: 178). The effect of games such as *Valiant Hearts: The Great War* is to 'create a learning experience closer in similarity to touring a museum than reading a book' (Anderson, 2019: 178). By combining an archival function with a critical, speculative perspective on big tech platforms, *Futurecall* shares a strategy with a number of what Eduard Arriaga describes as 'Afrolatin@ Digital Humanities projects', such as the Afrolatin@ Project and the Afro-Digital Museum, that 'are trying to remix and intervene in the digital archive' (Arriaga, 2020: 130).

One of the interesting aspects of this project, from a personal perspective, has been to let the creative and the critical intertwine. I first became acquainted with Rafael Coutinho's work while writing about it for my book *Posthumanism and the Graphic Novel in Latin America* (King and Page, 2019). Working on *Futurecall*, Rafael became a collaborator, and I not only got a chance to see the creative process in action but I also contributed to the evolution of his interest in the social impacts of digital technologies and the role narrative and aesthetics can play in shaping them. Rafael is a comics artist and graphic designer by trade, and this was his first go at designing a video game. Watching the process of adapting to the video game format, experimenting with what it can and cannot do, brought into focus the specific affordances of the medium. The sense of being both constrained and enabled by the medium, of having the narrative possibilities of the comics form curtailed while the potential for play was infinitely augmented, fed into the construction of *Futurecall* itself and its focus on the interplay between

technologies and agency. While it is useful as a vehicle for information, what it excels at is reproducing the constraints and affordances that are constitutive of specific forms of agency. Video games are, therefore, most valuable to the educator for their capacity to confront players with the active and ever-changing relationship between digital media and power.

Conclusion (Paul R. Merchant)

Both *Futurecall* and games like *La Puerta/The Gate* and *Sin Sol/No Sun* can be thought of as 'boundary objects', tools that facilitate more effective intersubjective and collaborative investigation of complex problems such as environmental change and the social impacts of digital technologies. Megan McKittrick has shown that video games can be used as boundary objects to enhance stakeholder engagement in discussions of coastal resilience in North America (McKittrick and Megan, 2022). In McKittrick's account, the operation of games as boundary objects that encourage cooperation between diverse stakeholders rests on their basis in action, their 'integrative exigence' in fostering dialogue, and their 'interpretive flexibility' (McKittrick and Megan, 2022: 38). All three of these characteristics correspond to the questions of networking and agency that we have foregrounded in our two case studies. Moreover, this article has suggested, in line with McKittrick's argument, that practice-based initiatives have much to add to previous theoretical discussions of games' engagement with contentious social and political issues. One limitation of the examples presented here is the lack of direct feedback from students and players: further work providing this kind of data would be especially helpful.

The first case study explores the use of video games to teach environmental humanities and the ways in which experiential learning achieved through game play and the particular opportunities and constraints built into certain games, impacts their effectiveness as a learning tool. After presenting Backe's framework for a critical approach to environmental games as a guide to how students might best be encouraged to analyse such games, it first explores how an ostensibly simple browser game in the survival genre – *La Puerta/The Gate* – is designed to focus attention on the need for deepening understanding and fostering caring relationships between human and non-human animals in order for humans to survive climate change. It then goes on to explore the impact of the more embodied experience that pervasive mobile games such as *Sin Sol/No Sun* can offer the player and thus their enhanced possibility of impacting player attitudes and behaviour in relation to the environment.

The second case study employs a science fiction-themed video game to raise critical awareness of the dangers of disinformation on social media. Most existing educational 'disinformation' games place the burden of responsibility on social media users by encouraging them to think twice before re-circulating information of dubious provenance. *Futurecall*, by contrast, places the phenomenon of disinformation within both the wider digital ecosystem (by presenting it as a symptom of human agency being increasingly shared with that of automated computer systems) and the history of the information (by using a science fiction plotline to situate the rise of Big Tech platforms and AI within a longer historical trajectory).

In these two case studies, video games appear less as an object of study than as a method of critical enquiry and reflexive pedagogical practice. Given the broader direction of recent developments in the gaming sector, this is unsurprising. While it is still possible to purchase video games as physical discs or cartridges, for many gamers, not least the casual and mobile gamers who make up an increasingly important part of the sector, a video game exists principally as a flow of data, often inseparable from or unplayable without a connection to the internet. This is a view of video games that is gaining traction with the industry's biggest manufacturers and developers: an article in *The Guardian* in May 2023 suggested that Microsoft was moving from a focus on its Xbox console to a 'post-console future' focused on digital platforms, where 'it sees players, not devices, as the future of games' (MacDonald, 2023). In this context, a critical perspective on video games that foregrounds player agency and the form of play itself seems likely to yield valuable insights, whether in Latin America or elsewhere.

Data Availability Statement

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

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