Journal of Community Engagement and Scholarship

Volume 13
Issue 3 *Climate Change Knowledge Translation*

Article 9

March 2021

Video Games and Learning About Climate Change

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COMMUNITY PERSPECTIVES

Video Games and Learning About Climate Change

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Introduction

It is critical to pursue climate change education through a variety of methods, with a variety of audiences, and in a variety of contexts. This short perspectives article describes our experiences as an early-career climate change researcher and an independent game designer in responding to a community challenge posed by a nonprofit organization focused on the potential positive social impact of video games. This was an excellent opportunity to do some strategic thinking around climate change education (e.g., conceptualizing "butterfly effects"). However, we ultimately observed shortcomings in the supports available from educational and funding organizations for climate change knowledge translation using this cutting-edge medium, despite the urgency of climate change. This article follows a dialogic style, alternating between the two authors in order to provide an authentic account of our individual and collective experiences.

Richards

In March of 2016, I learned of the Games for Change (G4C) Climate Challenge, a broad call for aspiring, new, and independent game developers to produce concepts and prototypes for games that would educate players about climate change, with the incentive of cash prizes. I was right at the beginning of an open-ended postdoctoral fellowship, yet to officially graduate from my PhD program. As an early-career academic, I had only recently (just a month or two prior) settled on my research niche: knowledge mobilization for climate change and energy. The G4C Climate Challenge seemed like a serendipitous opportunity to me, as I was curious about the knowledge mobilization potential of video games and had always been an avid game-player (and aspiring designer) myself. I immediately thought to contact Michael, an independent game developer and my good friend, about a potential collaboration. For me this would be a unique professional development opportunity, allowing me to practice (not simply learn about) knowledge mobilization, develop strategic educational materials for a community audience (rather than my usual academic audience), and work intensively with a nonacademic partner. We soon settled on the premise of a visual novel—a game driven by narrative, dialogue, and characters—entitled "Nimo's Butterflies." In this game, the player would adopt the persona of a 12-year-old girl (the eponymous Nimo) with a superpower to predict the Earth's future. They would work to mitigate and adapt to climate change by convincing colorful characters to take action, triggering butterfly effects that would ripple through time (Figure 1).

Figure 1. Title Screen for Nimo's Butterflies

Long

After hearing about this idea from Garrett, I was excited to get to work. We only had a few months to work on this new project and couldn't make anything too ambitious, so I took a lot of the code I had already developed for a murder mystery game and used it to put together a similar style of interactive story. I also had some experience in bringing game development teams together, and was able to recruit an artist (Elaine Nieman) to draw the character portraits and a musician (Samuel Jackson) to compose and record the title theme. I was also happy to get involved because video games continue to grow in popularity as a medium, and leveraging that growth for a critical issue such as climate change is a great idea. Video games require active participation of the player, which could help engage players more than passive mediums such as movies or books. This interaction with the game can demonstrate that the players' choices do matter; they can directly see the cause-effect impacts of their actions in the game world. This is a perfect setup for understanding a complex topic like climate change. G4C has similarly observed the social potential of video games, which is why it spearheads initiatives like the Climate Challenge.

To provide a little bit of background, G4C is a nonprofit organization based in the United States, which, in its own words, "empowers game creators and social innovators to drive real-world change using games that help people to learn, improve their communities, and contribute to make the world a better place" (retrieved from http://legacy.gamesforchange.org/about/). More specifically, what attracted me to the Climate Challenge was that G4C was only asking for small game demos, and the winning demo would be given $10,000 to develop and produce a full game from that demo idea.

Richards

G4C included some intriguing recommendations in the full competition guidelines, which very much shaped our approach to the game. They challenged entrants to "encourage diverse audiences to understand and respond to climate change in their everyday lives" and "educate players to take action in the real world." The guide also stated that "the winning game would be engaging, entertaining, and empowering, allowing players to learn more about climate change and to better understand what they and others can do to make a difference." I decided that, given enough time and subsequent effects along a cause-effect chain, a fundamental tenet of the game would be butterfly effects, the idea that some small individual actions might ultimately have enormous impact at the level of governments, corporations, or culture.

A good example of this, best described by political scientist Kathryn Harrison, is that British Columbia's current leadership on carbon pricing may have its roots in the innocuous occurrence that the former Premier, Gordon Campbell, happened to read some books on climate change during his 2006 Christmas vacation. We built the game around the idea that if you could predict the Earth's future, you could find these causal seeds and trigger important impacts through butterfly effects. My thought was that if players could be convinced of this, they might be more inclined to pursue day-to-day climate-friendly actions, to increase their chances of setting off a critical cause-effect chain. It was a departure from my usual theorizing, to say the least!

Long

With extremely limited development time and no starting budget, it was important to focus on a small number of key goals: The game had to show the consequences of the player's positive actions on the climate, be relatable, and be short and fun enough to finish in a single sitting. We decided that the full game would only span the length of Nimo's summer vacation, that she would be able to visit just a few locations in her city during each in-game day, and that each location would present just a few characters Nimo could interact with. The demo itself covered only one day, one location (Nimo's coastal neighborhood), and three characters: Mr. Soilsmith (a gardener), Jammin' Ben (a beach-goer), and Mrs. Pinkerton (a rich neighbor). When Nimo interacts with the other characters, who represent a range of demographics and opinions about climate change, she can alter their outlook on the environment based on the player's dialogue choices, previous actions, and inventory items. Then, through her clairvoyance, she can see how these actions directly alter—in the future—a specific location in her city. For example, after learning from other characters about greenhouse gases, landfill emissions, and collective action, Nimo can convince Mrs. Pinkerton to recycle, which triggers a butterfly effect through the latter's connections, ultimately resulting in

Figure 2. Scenes from Nimo's Butterflies

the development of some new waste management technology capable of mitigating emissions from landfills. Then, if Nimo looks into the future again after setting off this effect, she will see that her coastal neighborhood is slightly less flooded than it was before she did so.

Richards

In writing the script, I felt it was important to preserve the general "feel" of a visual novel game, and not allow the educational components to overshadow the driving character development, puzzle-solving, and dialogue; I wanted to make sure the former didn't seem forced. Of course, many video game genres (e.g., murder mysteries) task the player with collecting information and then applying it (e.g., discovering clues in order to determine the killer), so I figured I could develop a script where everything the player has to learn and apply "happens" to be real-world information and arguments relevant to climate change. This included some basic natural science about greenhouse gases (e.g., the different warming potentials of carbon dioxide, methane, and nitrous oxide), some social science concepts related to motivations for action (e.g., tragedy of the commons, monetary incentives), and interdisciplinary or intersectoral information linking climate change to other environmental issues (e.g., landfills give off methane emissions and are also a hazard to wildlife). Nimo needs all of this information in order to convince Mrs. Pinkerton to recycle, setting off a butterfly effect. She learns the most from iterative conversations with Mr. Soilsmith, but also a little bit from Jammin' Ben and the social studies notes in her closet. This diversity of sources, as well as the intermittent humor, plot twists, minigames, and puzzle-solving (e.g., Nimo sometimes has to use a certain item or idea in order to unlock a critical conversation) is all meant to avoid the passive lecture style of many educational games: I wanted the player to feel entertained throughout, but be left with knowledge and a sense of empowerment after finishing the game.

Long

Sadly, "Nimo's Butterflies" was not selected as a finalist for the G4C Climate Challenge. That's not a shock, as we learned there were over 50 submissions internationally. We were, however, surprised to find that most of the finalists were games already in development long before the competition, supported by large budgets and production teams. Given the call for applicants of all experience level and a prize consisting of start-up funding and mentoring, we had instead expected we would be competing against prototypes from other independent developers. The finalist entrants were also the only ones to receive any feedback; after the announcement, we followed up to request some brief input on our concept but did not get a response.

I wonder if G4C missed an opportunity here to mentor, facilitate, or otherwise support some good ideas from a variety of independent developers, perhaps even putting the entrants in touch with one another or publishing a brief list of the projects. We were a little disappointed, but we were still happy with our demo and our general idea, so we searched for other sources of funding to make "Nimo's Butterflies" a reality. I applied to the Canada Council for the Arts under a research and creation grant. After a rather tedious process that

involved mailing a USB stick across the country, we were turned down with the response that they did not consider video games to be an eligible art form. We considered applying to the Canada Media Fund, but the process would have required us to become a corporation, conduct a market study, and complete extensive paperwork that didn't seem worth the slight chance of funding. We stopped there, and both moved on to other projects, but it's a shame "Nimo's Butterflies" did not come to fruition, as its design concepts and educational approach could potentially make a contribution to the challenge of climate change. We simply could not muster enough external support for the project.

Richards

In conclusion, the "Nimo's Butterflies" project sparked some interesting thinking, brought together some unlikely collaborators, and was generally a lot of fun. However, for us it mainly became a lesson about the shortage of support for video games as a medium for social change, especially concerning independent and academic developers. G4C is undoubtedly a fantastic organization, and it's possible we could have taken advantage of its other services and events, but we think they missed some opportunities with the Climate Challenge. Furthermore, there is no Canadian counterpart for G4C, and the possible supports in Canada seemed either uninterested or inaccessible, or are not widely known. To begin addressing some of these problems, we suggest the following considerations to any relevant organizations:

1. Consider video games to be art.
2. Acknowledge the presence and educational value of video games.
3. Promote the potential social value of video games broadly.
4. Make additional supports available for new and independent game development initiatives, especially ones based on collaboration between developers, academics, stakeholders, and others.
5. Create spaces to showcase projects and ideas at all levels of development.
6. Facilitate greater connection among those who are interested in the role that video games can play in social change (or in climate action specifically).
7. Follow the G4C model of creating targeted opportunities for specific social issues like climate change.
8. Ensure that all opportunities are widely known, especially by disseminating them to atypical audiences such as academics.

On reflection, during conversation with another academic, I was surprised to find that even I had internalized some of the negative perceptions listed above and often described "Nimo's Butterflies" as a side project that didn't count as real academic work. That's also when I realized I wanted to write this article with Michael. I now see this as an experience in community-engaged scholarship or action research, which has been fundamental to my current thinking around knowledge mobilization and climate change awareness. I remain very curious about the potential of video games, given sufficient support, to take our motivations and thinking into new areas, and that's just what we need during this area of impending climate disaster.

About the Authors

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