Using Game-Based Learning to Build Imagination, Hope, and Action in a Time of Climate Crisis

Praxis Project Thesis: Submitted in partial fulfillment of the requirements

for the degree of Bachelor of Arts – as part of the

Community, Youth, and Education Studies major at Clark University

Jesse Lowe

Clark University

Committee Signatures:

_____

Eric Demeulenaere

_____

Carmen Ocón

_____

Ben Resnick

Abstract

This study explored the ways that children engage with the climate crisis in a game-based educational context. Participants were ten children, ages 7 - 9, who attended a nature summer camp. They engaged in seven hours of games and conversation about the climate crisis. I took detailed field notes on their pre-existing knowledge, opinions, and actions. My findings indicate that, with factual knowledge and emotional support, children are capable of facing and addressing global crises through the use of games, skits, and conversation. This study revealed the importance of engaging young people in exploring the climate crisis in ways that strengthen their hope and empower them to take action.

Acknowledgements

Thank you Audrey for sitting with me in the craft studio while I first planned this project and listening to me talk about how sad it was going to make me. Thank you to Lucas and Idris, both for going to camp with me and for talking through this paper in its earliest stages. Thank you to my mom for always being willing to read my writing and my dad for feeding me while I write. Thank you to my entire network of collective care for grounding me in work that matters as well as meeting my needs while I went through this year-and-a-half-long adventure.

Thank you Carmen and Ben for being my readers. Thank you Eric for reading and rereading and guiding this entire project, from before its start to now. Thank you Sarah Cramer for introducing me to doing research in education, and CiCi Yu for years of discussions about education and how it could be better. Thank you Jane Higgins for supporting this project from the beginning and doing much of the logistical legwork that made it possible!

Thank you to the intergenerational group of weirdos who handed me a cardboard box of bananas on the street in the winter of 2018. Thank you for telling me about the better world, and welcoming me into the work of building it. This paper is dedicated to all water protectors & land defenders around the world, both the free and the imprisoned, both the living and the dead.

Table of Contents

Introduction: People & Place

Logan[1] was elected to a town-level political office at only 18 years old. Beatrice and Caleb organized with the Sunrise Movement, coordinating walkouts for climate justice across Greater Boston, while they were still in high school. Naomi spent a year in Christchurch, New Zealand, where she founded a program that monitors threatened bird populations. Ariel cooked and cleaned for an encampment of protestors in a forest, supporting their direct action against urban deforestation. Two cousins are both studying to become teachers, in the hopes that they can raise a new generation of climate activists.

These people are all between the ages of 17 and 21. They are using a variety of skills and strategies to enact climate action, across conservation science, politics, direct action, and education. They have been some of my closest friends since early childhood, when we met at summer camp at Habitat Education Center and Wildlife Sanctuary, which is run by the large conservation nonprofit Mass Audubon.

Habitat is a conversation between a group of people and a place. Every time I visit Habitat, I begin by tracing my hands across the 7-foot-tall Grandma Stump. More of her bark is stripped off every year, and more peaceful, solitary wasps move into her body. She shaded this area for over 300 years before being cut down. Now that she's a stump, kids take turns climbing her during free play. They cheer for and help one another.

As I begin to walk, I can tell how recently the trail has been woodchipped, and how recently the invasive plants along it have been beaten back. A butterfly flits ahead of me to the garden. The compost smells lovely, and when I look at the wilted weeds on top, I can see the 6-year-olds who threw themselves

[1] All names in this section are pseudonyms.

into pulling those up with me. In the free play area, there is no undergrowth, and the bark on the trees is scarred up to 10 feet above the ground by generations of campers engaging in rough play there, both with each other and with the land.

Of my friends who I listed earlier, Beatrice, Naomi, and I have become counselors at Habitat and Logan has joined the property staff. Some of us text about lesson planning ideas throughout the school year. We make sure to go for a walk at Habitat together during our winter break, when we all return from higher education in various states and countries. We have changed this land. This land has also changed us.

Habitat was an imperfect but essential part of my journey towards climate action. While I believe that the climate education I received at Habitat was far better than what most children experience, I still spent most of my childhood stuck in climate anxiety, guilt, and obsession with making individual lifestyle changes before becoming committed to systemic action. I worry that many other children never get climate education, or that when they do, they remain trapped in a cycle of anxiety and inaction. Beyond Habitat, on a societal level, our conversations about the climate crisis, especially the ones we have with children, are dominated by minimization and even outright lies. We do not admit the severity of the climate crisis and the scale of the global political transformation that we will need to survive.

The solution to this is not to tell children that their world began ending before they were born, or that they are powerless to build a livable world. Neither is the solution to tell children that they are the magical, chosen saviors who must redeem the sins of past generations. The solutions to the failures of climate education are complex and specific to each person and place. I believe that a partial solution can be built from the curriculum that Habitat has developed and refined over many decades. It can be refined and tailored specifically to privileged American demographics. It is game-based, location-specific, and age-appropriate. It made me and my friends climate activists, and I believe that it can create more climate activists.

Once I became a teacher, administrators at Habitat explained that they believed that the goal of the curriculum at camp was to help kids be curious, interact directly with nature, and create emotional connections to the land and organisms. While those things are helpful precursors to climate action, Habitat's leaders do not have any explicit political or action-based goals for their campers. In 2019, from higher up within Mass Audubon, there was a directive to incorporate education about climate change, threats to ecosystems, and conservation into every single lesson. We were no longer supposed to simply take kids to the pond to catch invertebrates, we needed to talk about pollution or drought in connection with the kids' experience. My personal philosophy doesn't line up perfectly with either of those stances. My ideal Habitat camp would provide some lessons that are only about exploration and emotional connections, some lessons about climate change, and some lessons about what effective climate action looks like.

The climate crisis is an existential threat, and none of our adaptations or mitigations thus far have been radical or large-scale enough to save us. While there are many different potential positive futures, all of them require herculean effort from well-informed and critically hopeful people who know how to work together. Every camper who attends Habitat has the potential to become the effective climate activists that we need. I believe that as relatively wealthy, privileged people from educated communities with significant political power, Habitat campers have an especially crucial role to play. They have a responsibility to use their privilege and power for good. They are the people who are going to own companies and regulate industries. They are going to lead nonprofits and fund campaigns. They could fundamentally change our economic and political systems to ensure climate justice and a livable future.

However, people who hold the most power under the status quo are also often the ones who are most likely to uphold that status quo. They often fear any change that will decrease their power, even if that change actually benefits everyone. In my conversations with parents and campers at Habitat, I often see liberal, individualistic attitudes towards climate change. There is a prevailing belief that all individuals have a responsibility to reuse tupperware and drive a Tesla – and then their duty to the earth is done. It is

difficult to move people past the stage of climate awareness where they believe that their individual actions are enough. It is difficult to convince people who are thriving under capitalism that they should destroy the system that is (temporarily) benefiting them. It is difficult, but essential.

In this practitioner inquiry project, I investigated the ways that the environment and curriculum at Habitat are affecting our campers' relationships to climate action. Over two two-week-long camp sessions, I took field notes on all of the climate-related lessons that I taught, paying special attention to the children's responses and attitudes towards the content. My initial three guiding questions were:

1. What do these children already know, think, and wonder about climate change?
2. How does learning about the climate crisis and climate action affect the way that these children view their role in the world?
3. How can education empower these children to practice stewardship of the environment?

When I began to analyze my data, I added an additional guiding question:

4. How do participants combine the silly and the serious, the representation and the reality, when discussing the climate crisis?

My hope is that this research will inform the efforts of future parents and educators, and that they will be successful in raising climate activists who will have the scientific knowledge, the political analysis, and the sense of duty that they need to build a more livable world for all species.

Literature Review

Already, natural disasters, extreme weather, and changing phenology are wreaking havoc on the ecosystems that humans belong to. The United Nations (UN) is one of the most powerful global actors on the issue of the climate crisis. Unfortunately, judging by their 17 Sustainable Development Goals, the UN appears to be laboring under the delusion that it is possible to sustain infinite economic growth on a finite planet (Dhara & Singh 2021). Similarly, the 2015 Paris Agreement on climate is limited in its impact

because its goals are “not part of a sustained political framework through which to address problems of the commons of Earth” and do not address the inherent contradictions of a world that is both a) ruled by global capital and b) sustainable (Roemhild & Gaudelli 2021).

Fortunately, there are alternative schools of thought. Dhara & Singh have named more interconnected solutions, drawing from the work of Kothari et al. in *Pluriverse: A Post-Development Dictionary*. Their list of climate solutions includes, “individual downshifting among the affluent classes, decentralized production, constant monitoring of human and planetary well-being, basic income and job guarantees, setting maximum income levels, changing lifestyles and cultures through grassroots action, stronger regulation of ecologically destructive industries, and eco-villages. In addition, multiple local, grassroots experiments in alternatives are being practiced by communities around the world, particularly the Global South.” I believe that all students have a right to accurate information about *both* the top-down, capitalist responses to the climate crisis and the diverse family of alternative responses that are growing from the ground up in the Global South. However, I do not yet have the curricular tools to teach those things well. If kids have no prior knowledge or experience with these ideas, even the best curriculum can barely scratch the surface in only two weeks of summer camp.

With this understanding of the current landscape of what effective and ineffective climate solutions look like, I set out to examine our common practices in climate education, both globally and specifically in the United States. Sharma identifies “three key issues in formal climate change education: (a) climate education is scarce and siloed; (b) the “commoditized” nature of learning “individualizes” issues for students and induces eco-anxiety; and (c) engagement with climate (in)justice is lacking.” I encountered all three of these issues, to different extents, at Habitat:

a) **Climate education is scarce and siloed.** Kids may come to Habitat, learn about the climate crisis and local ecology, and then go back to families and schools that never talk about it again. Mass Audubon does outreach programs, allows students to visit on field trips, and brings specimens

into schools in order to stay integrated into the broader community as a whole. Because these campers are largely drawn from wealthy, liberal, educated communities, and families that freely chose to pay for this camp, they are more likely to experience climate education across their lives than if we were drawing campers from elsewhere. During my research project, we taught the kids about wildlife counts and invasive plant removal, both activities that they can continue to do on their own and as part of larger community projects.

b) **The "commoditized" nature of learning "individualizes" issues for students and induces eco-anxiety**. Sharma defines the commoditized nature of learning as the way that our education system treats students primarily as commodities or products, and teaches them how to be good laborers rather than good collaborators or changemakers. While Habitat does not face as much of that pressure, with no externally-imposed standards to meet and no ranking or tracking of students, the attitudes that both teachers and campers learn in school still seep into camp day, and campers are still sometimes rewarded for conformity rather than creativity. I notice a significant amount of individualism not just in the attitudes of the people at camp but built into the structure of camp activities. One of the central traditions of Habitat camp is weighing the trash that our collective lunches produce every day and trying to get everyone to pack a low-trash or trash-free lunch – a practice that centers collective commitment to individual practices, but not quite structural change. Mass Audubon also has a legislative agenda centered on wetland restoration and investment in clean energy that is mostly absent from camp. Some of our games talk about political change (like the federal ban on DDT use being a key event in a game about ospreys), but most of our activities focus on individual choices that are not equally accessible to everyone, like planting pollinator gardens, walking instead of driving, and recycling.

c) **Engagement with climate (in)justice is lacking.** In my experience, Habitat camp does not engage with climate justice. We make an effort to have multicultural books for story time, but

there is no engagement with the fact that the climate crisis affects different people differently based on their relationships to power and oppression. There is no acknowledgement of class distinctions or the relationship between wealth and climate impact. While there are limits on what a summer camp focused on local conservation can cover in 2 weeks, teaching climate injustice should be a higher priority than it currently is.

On a more philosophical level, Roemhild & Gaudelli advocate for a prospective, not retrospective approach to education, one imbued with the politics of hope for the future (2021). In practice, this might look like assigning kids to design, plan, or envision something that doesn't exist yet, or to solve a problem that exists in the present, rather than only studying and replicating what has happened in the past. Mass Audubon recommends grounding climate education in a positive value like innovation, ingenuity, responsible management, stewardship, or interdependence to reduce climate anxiety and increase engagement (Fleischer 2013). These theoretical orientations lend themselves to interdisciplinary conversations about right relations and justice, rather than the singular focus on technical solutions that plagues our global conversations about climate change (Craps et al. 2016; González 2021). I went into this project with many thoughts of the future dominating my thoughts and the conversations that I have with my peers, but without the actual activities and curriculum to support bringing those conversations to kids.

While I was inspired by my research on grassroots climate action, prospective education, and positive values-based education, I was limited by time, resources, the IRB's exemption that applies only to "normal educational practices" and not to anything new or experimental, and the (mostly informal) norms of what is taught at Habitat. For the most part, I chose to teach in ways that I already had experience with: close observation of nature, stewardship, and game-based exploration of ecological relationships. The use of tools, contact with professional scientists, and teacher-led conversations about oppression and justice were all omitted from this project. In only two weeks, I was unable to teach the foundations of earth systems science and theories of political power that are prerequisites for talking about real, global climate solutions. My ideal climate education would prepare kids to be active citizens in both democratic and

consensus-based organizations, rather than prepare them to be laborers as Sharma says our current education does. I dreamed of teaching children to participate in many different forms of decision-making, campaigns of direct action, and prefiguration of the world they want to live in. Unfortunately, that is not what I delivered.

I hope that by describing and analyzing Habitat's curriculum, I will be able to add some strategies that we Habitat educators have developed to overcome the many obstacles to climate education for action. Still, there are many important skills missing from the programs we offer our kids. Over the course of this project, I grappled with the question of how much political and global information is possible or desirable to add to the curriculum. While my initial dreams of radical, comprehensive climate education will never fit into 2 weeks, I have concluded that small shifts in content and priorities would make Habitat camp a better incubator of radical climate activists.

Conceptual Framework

Play

All of the planning that I do for camp rests on the foundational understanding that play is the work of children (a folk idea that is often misattributed as a direct quote from Jean Piaget, Maria Montessori, or Fred Rogers). While Habitat is an educational camp and our activities are expected to have learning objectives and checks for understanding, all of the learning comes from creative or game-based activities. Rather than inviting children to set aside their play and join the work of learning in the ways that adults do, we choose to join children in their world of play. Silliness, creativity, humor, and storytelling are welcome. We teachers attempt to invite our campers to co-create games, skits, and narratives that will help them learn by representing reality.

I define play as all voluntary, pleasurable activities. Play is a process or series of connected events, not a single thing. Not every instance of activity in the world can be neatly divided into play and not-play. Rather, activities fluctuate along a spectrum from being entirely play to not-at-all play. Play has fuzzy boundaries: over the course of an activity a person can slip in and out of one or more qualities of play.

Zosh et al have described educational play as a spectrum from entirely student-directed to entirely teacher-directed. Play is best for social-emotional learning when completely student-directed, but best for academic learning when the teachers impose some constraints. In their work on best practices in play-based education, Zosh et al found that the teacher-directed games best support student learning when the learning objectives are inherent to gameplay, not incidental (2018). A study on game-based learning found that the most effective educational games challenge players to construct new connections between their knowledge, rather than asking them to only repeat things they were taught before. Students also retain information better when their learning is rewarded with in-game affordances. Games that focus on collaboration and problem-solving teach valuable skills, whereas games that focus on winning and losing distract from the learning objectives (Westera 2019). Most of Habitat's games already follow many of these best practices, and when possible, I tried to adjust the games to be in line with these evidence-based recommendations.

The games that we play at Habitat are all representative of the real world. Popsicle sticks are resources that organisms need to live, and kids tagging each other are predators hunting and eating their prey. Project WILD and Project WET are the two sources of curriculum that have influenced Habitat the most. Most of our games are composed of several rounds of play with discussion in between. During each discussion, the kids and teachers connect the representation to the reality of history, biology, ecology, and earth systems science. As part of this project, I put more effort into allowing children to demonstrate their learning by substantially changing the gameplay themselves, based on their ideas and interests. My hope is that by using their knowledge to change the representation, they will be more capable and empowered

to try to change the real world. Pearson et al have theorized that play involves many processes associated with adaptive functioning, including creativity, coping, and hope (2007). Both in terms of political change and in terms of ability to change their own lives, play is a space in which children practice and feel their own power over the world around them, which strengthens their sense of hope. In the mid-game conversations that we have at Habitat, children and teachers can use the common language of the activity to talk about complex and potentially frightening processes like ecosystem collapse. Several of the great thinkers of the constructivist model of education believed that children need to interact with the world and with each other in order to build knowledge (Kimmons). We try to provide children with the opportunity to do that, too. As partners in developing the game, teachers and children can exchange ideas, breaking out of the banking model of education and into a collaborative and constructivist approach.

Children learn by doing, and the majority of what they do is play. The role of the teacher is to enable and empower children, within boundaries that keep children emotionally and physically safe enough to learn. Teachers are primarily facilitators, not commanders: they might step in to clarify or push children's thinking, without controlling children's learning. Play is a natural and positive way for children to learn by doing with joy, with imagination, and with each other. It can connect students to content by asking them to act out a real process or put themselves in the shoes of someone else, and it can also provide a buffer between the student's feelings and the harsh reality of the content being taught. Both of these are true at once because play allows participants access to a wide range of moods and tones. Collaboration pushes participants to learn about each other, and to learn interpersonal skills, in addition to the target content. When people construct knowledge together, they each learn from each other in addition to what the learn from the situation. They may challenge each other or build on each other in unpredictable, organic ways that are impossible when one person constructs knowledge on their own.

Hope

I don't only want my campers to retain ecological, scientific information from their time at camp. I also want them to develop critical hope and radical imaginations. Jeffrey Duncan-Andrade (2009) has written about the importance of a critical hope that is both realistic and action-oriented. In the context of climate education, critical hope means recognizing that no single person's actions are enough, but that every single person's actions are worth the effort. It means recognizing the difficulty but possibility for systemic historical and political change, towards a livable future. In my experience, children have an advantage in the development of these skills, because many adults have had their hopes and imaginations worn down by adverse experiences like being forced to do schoolwork and professional work that doesn't matter to them, and that doesn't make a difference in their world.

Radical imagination is a related concept developed by Robin Kelley, specifically in the context of many generations of Black liberation movements. Kelley writes that "without new visions we don't know what to build, only what to knock down. We not only end up confused, rudderless, and cynical, but we forget that making a revolution is not a series of clever maneuvers and tactics but a process that can and must transform us" (2003). In past years at Habitat, I have had campers propose that we build giant Roombas that suck pollution out of the environment, and use blocks to build conservation areas that meet the needs of all of their resident animals. They are already exercising their radical imaginations.

Methods

This project was an exploratory inquiry that relies on qualitative methods. There is an element of autoethnography because my guiding questions and ideas draw so heavily on my experiences as both a camper and a teacher (Starr 2010). I am attempting to understand how I became the person that I am by interacting with other people who are experiencing similar things, 14 years later. The lessons that I choose to teach and the questions that I ask my students are drawn from my most vivid memories of camp and of my own process or learning about the climate crisis.

The heart of this project, however, is practitioner inquiry, a process by which I examine and re-examine my own practice of teaching in order to better understand and improve the education that I am providing. Practitioner inquiry research (PIR) is often used in educational settings because it puts the power to positively change education in the hands of educators (University of Florida 2016). I have been teaching at Habitat and informally experimenting with my teaching and reflecting on it by journaling and talking with my friends, but this was the first time that I formalized that process as a research project.

Site Description

Habitat Summer Camp is part of the conservation nonprofit Mass Audubon. The organization's mission is "to protect the nature of Massachusetts for people and for wildlife." Their values include stewardship, teamwork, and action. In their action plan, they write, "These are not ordinary times. Massachusetts faces significant challenges—including the rapid loss of wildlife habitat, inequitable access to nature, and the threat of climate change—that deeply affect the health and well-being of our environment and our communities. And yet, as we emerge from a global pandemic during which more people than ever found sanctuary in nature, signs of hope and optimism abound."

Habitat is a day camp split into many different programs by age. The youngest campers are the Ramblers, who are 4, and only spend their mornings at camp. Next are the Pathfinders, who are 5 and spend the full day at camp. The largest group, and the heart of the camp, is the Explorers program. There are 60 Explorers, ages 6 - 9, and they are usually broken up into groups of 10 by age in the morning. In the afternoons, they have "Options" – they choose between five different activities and mix across age groups. The 20 Ecologists are 10 - 12 years old, and they spend mornings as a whole group and afternoons broken up into three groups with one teacher each. On the last day of each session, they pitch tents at Habitat and sleep over. The Trekkers are a group of 10 between the ages of 12 and 14. They do both day trips and three-day overnight camping trips at other wildlife sanctuaries around New England.

Campers are encouraged to become counselors in training between the ages of 14 and 16, and many go on to become paid staff members. There is also an aftercamp program where all age groups are mixed together and campers have less-structured programs for up to two additional hours in the afternoon.

The land is roughly 120 acres of forest in a wealthy, residential neighborhood on top of a hill. It borders partially-forested land owned by the Belmont Hill School, and more natural land at Lone Tree Hill, Rock Meadow, and Beaver Brook North Reservation. Each day, campers arrive in the parking lot and travel through "the house" – a mansion built by the previous owners of the land, renovated to fit the needs of a wildlife education center – to use the bathroom and store their belongings in cubbies. They have free play areas off of trails, in oak- and pine-dominated areas with little underbrush from constant human use. They play running games on woodchip fields and grass fields. They visit the community garden, the meadow (where the Nigerian dwarf goats live in an enclosure), and two different ponds. Habitat camp activities tend to be more structured and educational than many other camps, but still more play-based than traditional school activities. On a given day, nearly every camper can expect to go for a hike, make a craft, read a picture book, and play an educational game that involves pretending to be a specific animal or plant.

Participants

The children who attend Habitat camp are mostly from the cities of Arlington, Belmont, and Cambridge. 77% of them originate in families with an annual income over $140,000. Many have family members or paid caregivers who are able to drive them to and from camp (which is not accessible by public transit) at 9am and 3pm every day. My participants in this study were drawn from the Explorers group, so all of the campers were between 7 and 9 years old.

Three co teachers also participated. The primary deciding factors on whether a camper or a staff member is part of my research are their interest in the project, which may correlate with their familiarity with me, their passion for climate justice, and/or their comfort with academic research.

First Session Participants [2] Kids aged 8.3 - 9.5, at camp July 17 - 28	
Roselle	This co-teacher is only 16, but already a very capable and experienced teacher. They were a counselor-in-training here the past 2 years so we knew each other before working together.
Gus	This camper seemed quiet and serious at first, then became very silly the second week. They're able and willing to jump into any conversation, with anyone. They love their 12-year-old Ecologist sibling. They go to school with Adele. I had them in my group for 2 weeks as a 5-year-old 3 years ago.
Olivia	This camper was focused, knowledgeable, and proud of their hard work. They were especially confident in interactions with teachers. They sometimes asked questions like "Is this part of the research project right now?"
Martin	This camper had the biggest personality. They were often goofy and sarcastic. They quickly made friends with similar personalities (including Gus), and didn't really interact with anyone outside of their little circle.

[2] All participants' names are pseudonyms.

Adele	This camper had soft happy energy. They were excited to participate, and often volunteered to be a tagger in running games. They go to school with Gus. I talked with them and their parents about the research project regularly at pick-up time. They love their 5-year-old Pathfinder sibling.
Avery	This camper was quiet, rarely participating in group discussions. They love ball games but also making friendship bracelets but also nature journaling but also tag games. I had them in my group for 2 weeks as a 5-year-old 4 years ago. They spend a lot of time with their 7-year-old Explorer sibling.
Drina	This camper spoke only when spoken to, in a very quiet voice. They smile, always respond positively to check-ins, and are most interested in art activities.
	3 other campers and 1 14-year-old volunteer counselor-in-training were present and did not consent to participating in the research project.

Second Session Participants Kids aged 7.1 - 8.1, at camp July 24 - August 4	
Daniel	My co-teacher was 20. They were a camper and leader in training when they were younger, but they hadn't been back to camp for 3 years and this was their first time as paid staff. They study physics and have been a farmer. They have one younger sibling (age 16) who is also a paid Habitat teacher.

Louise	A third co-teacher, age 20, added during the second week for limited hours as an aide. They have worked in nearly every program at Habitat over the last four years, and have been my camp friend since we were 12 and 13 years old. They have four younger siblings who are also volunteers or campers at Habitat.
Alby	This camper was confident, opinionated, and silly. Sometimes, they were more interested in teachers than peers and experimented with pushing teachers' boundaries. They attended camp with their cousin (age 6, in a different Explorer group).
Liam	This camper was athletic, independent, and full of nature knowledge. They immediately made a best friend with similar interests and functioned as part of a pair for most of the session. Their favorite shared activity was making projectiles (paper airplanes, crumpled paper balls, etc.) and throwing them.
Jay	This camper was sweet, capable, positive, and independent. I had them in my group as a 5-year-old two years ago. They remembered me and asked a little bit about the research project. They love their older sibling, who was in a different Explorers group.
Sonam	This camper was knowledgeable, talkative, and self-assured. They came to camp with a best friend from school, and the two of them gradually incorporated Alby and became a trio of friends by the end of the two weeks.
	7 other campers and 1 14-year-old volunteer counselor-in-training were present and did not consent to participating in the research project.

Positionality

I am from Cambridge, and my family is in the third income tier ($70,000 - $99,999 annual income), meaning that 87% of my peers came from families wealthier than my own. I am both Black and white and based on my appearance, I am generally assumed to be entirely white, mixed, and/or Hispanic. I have struggled with my mental health since my childhood, and the skills that I have learned to help myself are invaluable in my teaching. I am a shapeshifter: able to connect with my neurotypical campers and my neurodivergent ones, with my white campers and my campers of color, with my campers who are wealthy and my campers who are not.

I attended camp at Habitat for 9 years and have worked there as a teacher for 4 years. Among Habitat staff, I have chosen to participate in camp culture, to learn and lead annual traditions. I speak in and contribute to the specialized language that describes our collectively significant locations and the fictional characters that inhabit them. I have been connected to this place for so long that I have played some of our most classic games dozens of times, and I have crossed paths with literally thousands of people there. To campers, I am an insider-outsider: someone who used to be a camper and remembers what it feels like, but who has since taken on the more powerful position of a teacher.

I worked with Jane Higgins, the camp director (and my role model since I was 6), to choose the topic and scope of this project. Individual lesson plans were developed and executed with help from my co teachers. I had initially intended to structure ways for both campers and co teachers to provide feedback and guide the direction of the project as it unfolded, but I became overwhelmed just by teaching and did not meet that goal.

Epistemological Stance

I am an expert on my experience. The kids are experts on their experiences. My hope is that I can speak for myself and amplify what they said and did in a way that honors them. While we did not experience the same events in the same way, we changed each others' experiences by being together. Every child and coworker left little marks on my mood, memory, and learning with their presence, their facial expressions, their movements, and their words. I learned from the other participants in this research and from the conversations I had outside of it, in compiling my literature review, in reading the news, in talking to my friends about their feelings, and in participating in climate action. Most of the knowledge that I produce here is not generalizable, it is specific to these people in this place. It is intended to be useful to a general audience as inspiration and as a blueprint for how other people in other places may choose to build their community conversations about the climate crisis.

Data Collection

I wrote field notes about each of the seven lessons at the end of every camp day. I used field notes to capture the experiences that I remember having, exactly as I remember them. They filter reality through my priorities, both conscious and unconscious, making them an effective way to reflect on the way that I exist in and process the world. I took note of the prior knowledge that my students brought to the start of each lesson and their ideas for potential solutions and actions related to the problem that the lesson poses. I noted the development of their ideas over the course of the week as individuals and as a whole group.

This project solely focuses on qualitative data. I followed the recommendations of Bogdan & Biklen (1982) on qualitative research for education. Over the course of the session, I developed descriptions of each of the campers. I was as accurate, concrete, and specific as possible in my field notes, but I recognize that I was limited by my biases, time constraints, and memory. I reconstructed dialogue from memory and grounded each day's reflection in the physical setting. Whenever possible, my field

notes included notes on campers' and teachers' body positions and physical interactions with the space, such as digging in the dirt while listening to instructions or wandering away from the game to investigate an insect. My field notes also include the high and low temperature for each day that data was recorded.

Data Analysis

I first completed an open-coding of my field notes and recorded the codes that were emerging. Based on these codes, I wrote my fourth guiding question. Separately, I returned to my initial three questions and pulled as many potential answers as possible from the data. I sorted my data by which of the three initial questions it addressed.

I found myself most deeply analyzing the Birdstacle Course game (played twice, on the first day of each session), All-Camp Morning (the first Friday of the first session), and the Atmosphere Game (the second Monday of the first session.) These activities became the case studies around which I based my analysis.

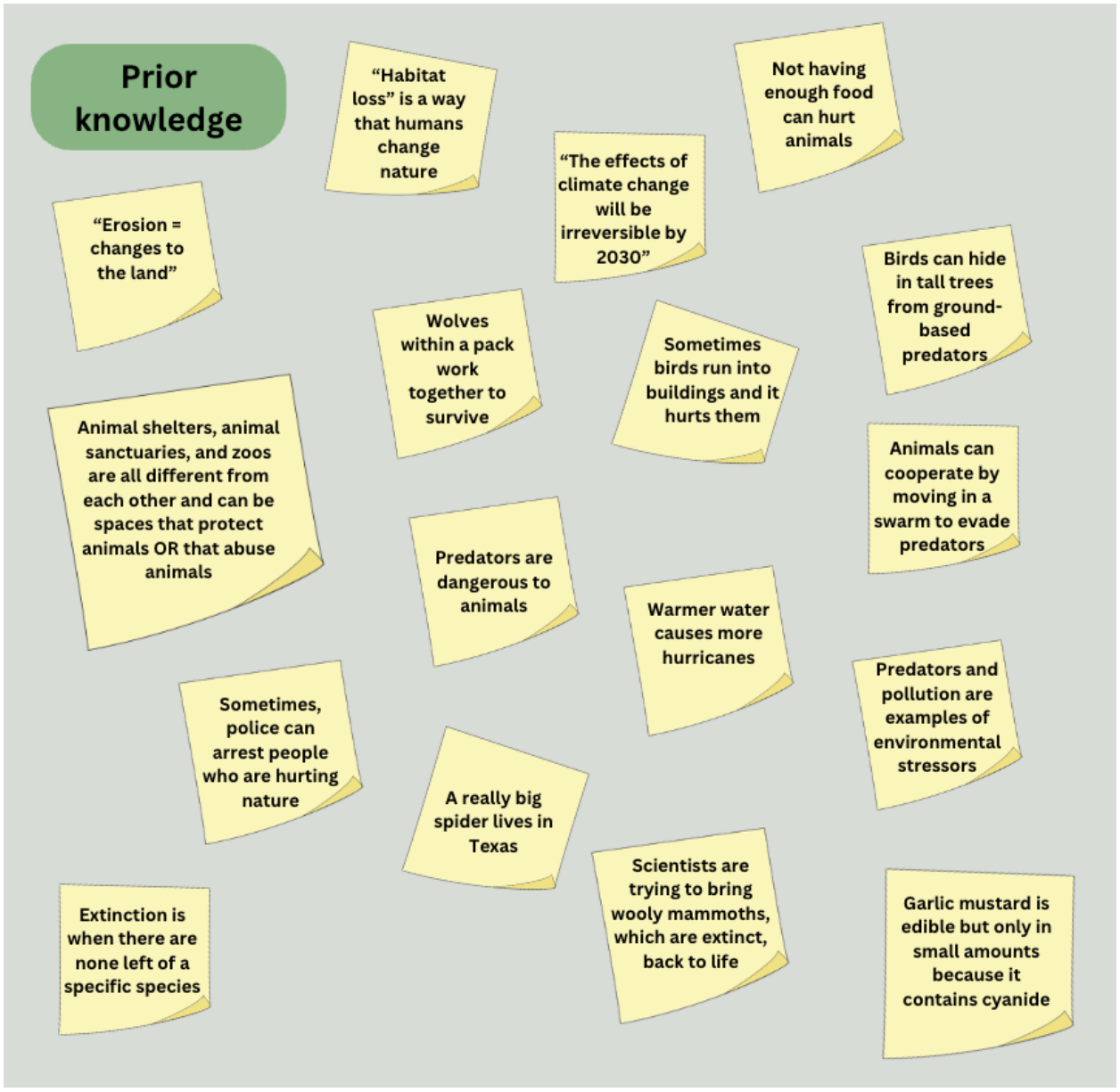
The codes that emerged from my data were invitations, prior knowledge, tragedies, hope & empowerment, and interactions between representations and realities. Invitations are moments in which I, the teacher, posed a question to the group or made space for kids' ideas to emerge. The "prior knowledge" code came up very frequently – it is any time that kids brought in the things they already knew, whether it be from experience, from famous YouTuber MrBeast, from school, or from David Attenborough documentaries. It's important to me to amplify the wide range of expertise that kids brought to our games and discussions from their own rich understandings of the world. This is a matter of respect and of collaborating with kids to create new knowledge rather than trying to control them.

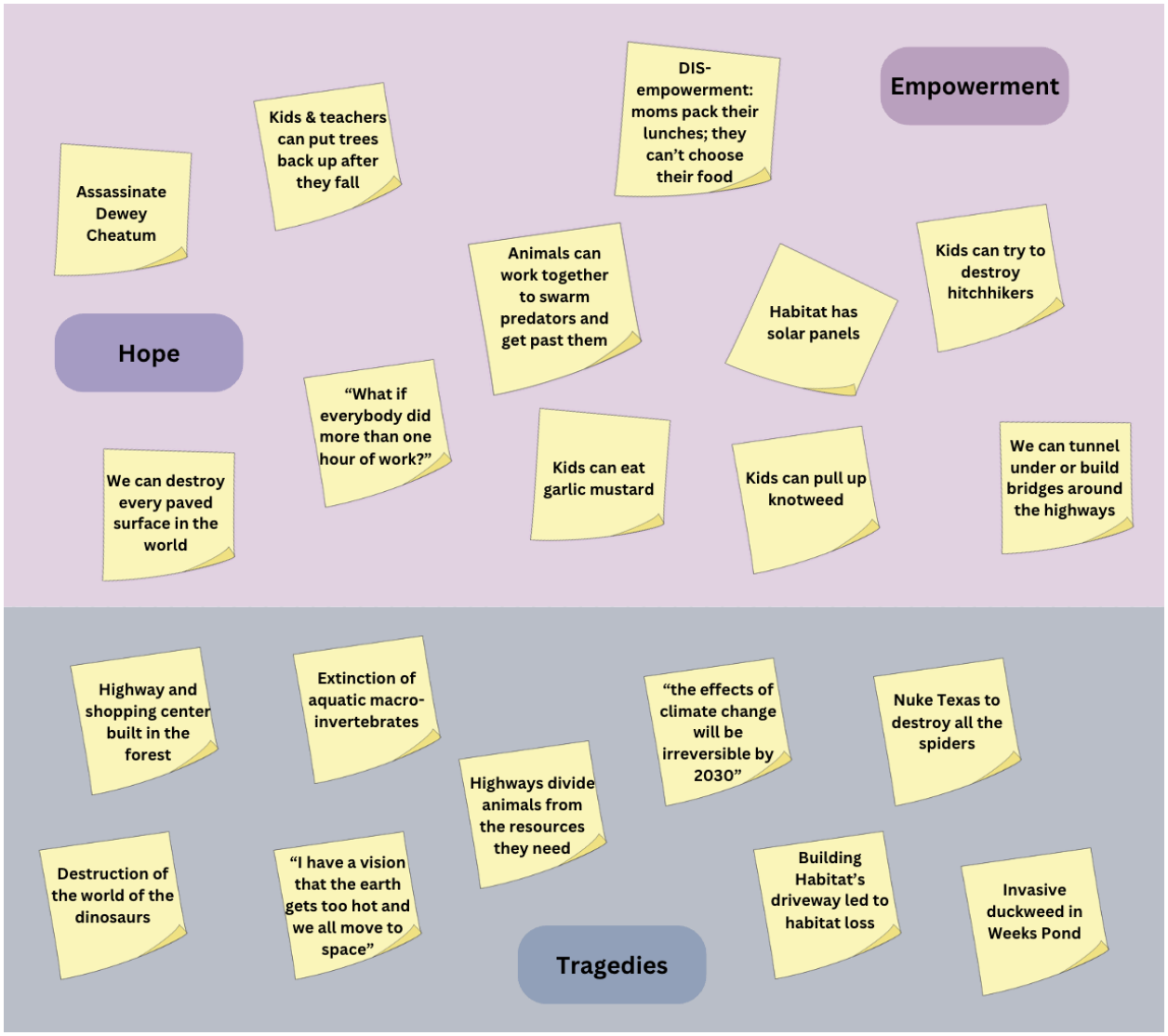
Tragedies were comments and situations, originating both in the lessons I taught and in the topics that kids brought in, in which something precious was lost or destroyed. We discussed tragedies as small as the habitat paved over to create the driveway and as large as the entire planet becoming unlivable. The

category is more subjective than I had initially anticipated. Martin wanted to nuke Texas to destroy all of the spiders and they would be thrilled if that actually happened, but I coded them talking about it as a tragedy because it would be one to me (and to the entire state of Texas). When they talked about moving to space they did so dramatically, solemnly, but they may have also had an element of adventure-seeking and curiosity about life in space. Maybe they didn't perceive a move to space as meaning that we have fully lost the Earth, as I do. None of these tragedies were so big that a child cried, stayed distressed beyond the end of a game, or removed themselves from the game or conversation. Outside of this project, in a situation where five-year-olds were listening to a suspenseful story about tree huggers being threatened by axes, one child removed themselves from the activity and took a break to calm down.

Hope and empowerment began as two separate categories. I saw hope in moments where kids noticed nature flourishing whether it involved human intervention or not, and in moments where we talked about other people doing things like re-introducing an endangered species to an area where it belongs, or building a wildlife bridge over a highway. Hope was found in the actions of others. Empowerment, on the other hand, was more specific to what kids were able to do. Empowerment is a sub-category that specifically holds the things that kids can do, have chosen to do, and/or plan to do. The camper who pulled apart invasive seeds hoping to destroy them and the kid who described a plan for how to kidnap a real estate developer were both empowered, not just hopeful. Hope and empowerment were intertwined and overlapping: they are moments in which kids offered solutions or worked to improve the world.

Gradually, I also came to theorize my final and most complex code: interactions between representations and realities. When kids applied knowledge from the skit to the real world, or used their knowledge of how real bird migrations work to add a new challenge to the bird migration game, they were putting our representations and realities in conversation with each other. This is a two-way interaction that can be initiated by kids or by myself and the teacher, but once the passageway between representation and reality is opened, the kids often take point on making and deepening connections between the two worlds.


Prior knowledge
"Habitat loss" is a way that humans change nature
Not having enough food can hurt animals
"The effects of climate change will be irreversible by 2030"
"Erosion = changes to the land"
Birds can hide in tall trees from ground-based predators
Wolves within a pack work together to survive
Sometimes birds run into buildings and it hurts them
Animal shelters, animal sanctuaries, and zoos are all different from each other and can be spaces that protect animals OR that abuse animals
Animals can cooperate by moving in a swarm to evade predators
Predators are dangerous to animals
Warmer water causes more hurricanes
Predators and pollution are examples of environmental stressors
Sometimes, police can arrest people who are hurting nature
A really big spider lives in Texas
Scientists are trying to bring wooly mammoths, which are extinct, back to life
Extinction is when there are none left of a specific species
Garlic mustard is edible but only in small amounts because it contains cyanide



Findings

In my Reflection on the Intervention, I find that this project cannot have the big impacts that I had hoped for; it is only planting seeds that may grow into something bigger over time. I first examine the Prior Knowledge and Climate Doomerism that kids brought into camp before any intervention took place. I find that kids already know a lot of scary information about the climate crisis, and they are already

starting to learn about the solutions that are most prominent in the media (ex. space exploration, recycling). In Empowerment and Action Plans, I explain how we used both structured and unstructured conversations to explore individual lifestyle changes and talked vaguely about money and power. Next, I explore the ways that kids benefit from Passing Between Representation and Reality, connecting the actions that they take in fun and imaginative activities to actions that could be taken in reality. Finally, I will argue that through discussion and games that exemplify climate action and through collective actions at Habitat like removing invasive species, we empowered children to imagine and dream of bigger direct actions that they may take in the future.

Reflecting on the intervention

The goal of this project was to provide educational experiences that empower campers to take effective climate action. Habitat was already a site where this is happening, to an extent. I explored questions like, "What has Habitat always been doing? What do our kids already know, understand, and do? What is working? What isn't working?" I examined *how* Habitat is already providing climate education for action and how to expand on concrete educational strategies that are already working.

The intervention here was small: I only spent 7 hours directly teaching this project, with a group of only 10 kids, two times. I had very broad and high expectations for the kind of education that I could provide. I wanted to dive into theories of political change as well as ecology, and connect to a much wider world than Habitat and the Eastern woodland ecosystems that the curriculum centers. While part of me definitely knew that was impossible, I was still disappointed in the moment when I could feel my limited time running out while we were still only scratching the surface.

However, having completed the project I am more appreciative of the importance of imagination, emotional connection to nature, and time to play with ecological concepts that I was able to facilitate for my campers. I believe that these experiences (embedded in a camp that kids often return to) had ripple

effects into the rest of these campers' lives. I believe that they will teach their friends and family the information and attitudes that they develop at camp. I believe that they will be more likely to take effective climate action later on in their lives, and that their action will represent a significant contribution to this essential global movement. Changing one person's mind and heart matters, especially when that one person controls material conditions. I also believe that if teachers, parents, and activists read this paper and take inspiration and strategies from it, my personal reflections will have a ripple effect that will expand far beyond people who know me personally. I have no way to measure the concrete effects of this project years in the future. All I have is hope.

Prior Knowledge and Climate Doomerism

On day one, I found that kids know that life as they know it is in danger, and they know that some solutions exist. One of the kids' comments that I felt most concerning was a sentence that Gus said within the first two hours of arriving at camp on the first day: "the effects of climate change will be irreversible by 2030." That statement has been a call to action for many segments of the global movement for climate change; however, the people I trust and work with have largely abandoned it because it can cause climate doomerism. It implies that after a certain point, there is nothing else we can do, which is objectively not the case. A more accurate statement would be "many effects of climate change will be irreversible by 2030, just as some effects of climate change are already irreversible. However, the longer we wait to revolutionize the economy the more drastic the change will be. It is important to act now, and it will be important to act at every point in the future." Unfortunately, that more complex framework is not as accessible to kids both because of their knowledge base and just because that's generally not what the news reports. Similarly, in that same first-day conversation, I was frightened to hear Martin say that he has "a vision that the Earth gets too hot and we all move to space." Kids are hearing billionaire Elon Musk's talking points about fleeing to a livable future in space, rather than building a livable future right here.

These early conversations gave me a sense of where the kids were coming from without any intervention. The kids may not have the background knowledge to understand the mechanics of phenological change or national climate policy, but they hear and remember the headlines and big ideas of "adult" climate discourse. They know disconnected but significant and scary pieces of information. This information affects their play and their visions. They know that something desperately needs to change, and they are beginning to imagine what needs to change and how. My task over the next two weeks became to build critical hope by exploring more possibilities for what could change about our world, and to emphasize changes that are more than just the doomerism and ultra-wealthy escape plan that the news media is presenting to kids.

Empowerment and Action Plans: What Are the Kids Gonna Do About It?

Throughout our time at camp, kids talked about making climate-friendly lifestyle choices, actively managing ecosystems, and taking direct action against the destruction of the environment. The comments that they made about lifestyle choices mostly arose during informal conversations, and less during the planned lessons that I taught. This surprised me at first simply because it was different from what I had envisioned, but then it made more sense: we know that kids often learn the most when they choose the topic and play with new information. During unstructured conversations and free time, kids are able to continue processing the information that we talk about in our lessons, but without the pressure of raising their hands and delivering a correct answer before the group moves on.

On the very first day, we had a structured conversation about the camp rule "respect nature," and then returned to the same topic in an unstructured conversation at lunch. During the first conversation, kids volunteered the idea that there are spaces we shouldn't enter because they're for wildlife. They took pride in knowing and respecting boundaries that help protect wildlife. At lunch, kids initiated a respectful

conversation about how some people are vegetarians in order to reduce their contributions to climate change. Jay shared that their family is all vegetarian for this reason. Everyone at the table was comfortable sharing whether they were vegetarians or not, but everyone seemed to stop themselves short of recommending that anyone else change their behaviors. I was relieved by this, because I was worried about arguments breaking out or people shaming each other for their decisions. That would have been bad for the group dynamic and simply an ineffective way to convince people to change their behaviors. I hope that the gentle, non-judgemental conversation that we had will get kids thinking about their diets, and imagining possibilities for more ways that they could respect nature. Maybe after a few more conversations, or after time spent thinking and learning, the kids will change their behavior.

We also talked frequently about the amount of trash that we throw away at lunch because of a tradition of weighing the trash at the end of every day and singing a special song if the 60 explorers' combined daily trash weighs less than half a pound. (When I was a camper, the goal was to get under one pound, but the kids started succeeding so often that the staff increased the challenge by making the goal half a pound.) The kids seemed to fully understand and internalize the idea that their individual choices about what to pack for lunch and how to throw away, recycle, or compost their waste can affect nature. However, some of the kids say that their parents pack their lunch and they have no say in what they get, an instance of disempowerment. Other kids have reported hiding their trash in their lunch box and throwing it away at home so that they can have the reward of singing the song without actually doing the work of protecting nature. That is an example of a moment in which the kids uncouple the representation from reality, and think that they can celebrate having less trash in this specific, measured moment while still producing excess waste in the real world.

We also have no lesson plans about the problems of contaminated recycling, decrease in quality of recycled plastic, or the energy costs of recycling. Neither do we talk about the amount of waste that wealthy countries ship to landfills and trash-burning facilities across the world. Taken together, I think that our curriculum on waste management is a great example of teaching an individualist, local, surface-level

view of the climate crisis, as Sharma warns against. It would be wrong to stop our education there, but I believe that this is a good starting place and foundation for kids who are going to learn better and do better as they grow and develop more complex understandings of the world.

In the second session, a completely unplanned conversation while hiking returned to themes of class and power that are so rare at Habitat. The kids started talking, unprompted, about what they would do if they were rich. They talked excitedly about how they would share their money with homeless people and buy everyone everything that they need. To me, this conversation indicated that the kids understand that wealth is a key factor in who has the power to change the world, but that they may not be thinking about how wealth could protect nature. It seems that they are not aware that the majority of them belong to families who make more than twice the median family income in the wealthiest country in the world. Our camp curriculum does not currently address wealth, power, social class, or international relations. To me, this conversation among the kids shows that they are interested in and ready for education on these more complex topics. I believe that Habitat (and many other providers of education) avoid such conversations because of the political discomfort of families and staff, not because the children are incapable or unready.

During the Macroinvertebrate Mayhem, Birdstacle Course, and Forest Fragmentation games, they talked about ways that people could protect nature but in ways that are not actionable for kids. These conversations were hopeful but not necessarily empowering: they taught kids that scientists can reintroduce threatened species to a space, that urban planners can make cities safer for migrating birds, and that the leaders of massive infrastructure projects should consider how their building affects the surrounding habitats. They have hope because those big positive actions are possible, but they are not directly empowered because they, as kids, have no power to contribute directly to those solutions.

Empowerment emerged more when we talked about kids' roles in ecosystem management on all-camp morning, when we talked about invasive species. While removing goutweed and enchanter's nightshade, which are both native fast-spreading and undesirable plants, on Habitat's property, the kids

talked about their prior experiences with invasive plant removal. Olivia had pulled up and eaten garlic mustard outside of camp. Another camper, Adele, collected some enchanter's nightshade burrs and pulled them apart with their fingers to try to destroy them and make them unable to spread. They talked about being proud of their hard work when they destroyed invasive knotweed at a different camp.

Olivia and I talked all the way through lunch about how she has invasive Japanese knotweed at her grandparents' Cape Cod summer house and she's very excited to help them get rid of it. I told her, "I bike through a forest of knotweed every day on my way to camp and I think a lot about how if everybody took out a little bit, if everybody who uses that bike trail spent one hour a week getting rid of it, it would all be gone." Without missing a beat, she said, "And what if everybody did even more than one hour?" This was a moment where I felt like I was engaging with an equal thought partner, where we were working together to radically imagine a positive future and the action steps that it would take to get there. What if everybody did more than one hour? What would the land look like? What would our relationships with each other look like, if we worked alongside our neighbors to save our neighborhood? What would the structure of our time look like if we had organized childcare and pay to support people working together to accomplish shared work for a sustainable future?

This was a moment in which I felt like I was retracing my steps from my childhood: I pulled up invasive plants as a camper at Habitat, which got me curious about how to identify the plants in my yard, where I discovered more invasive plants and recruited several friends to help me pull them up all over my neighborhood. I encountered local climate organizations that were doing the same work, and joining them helped me learn more, take more action, and become more politically radical. I hope that these kids will begin to follow the same path.

One of my proudest moments was when I discovered that my camper Martin was spending his free play time propping up trees that had been uprooted by a storm so that they could continue to grow. These are moments in which children demonstrate, by taking action with their hands, that they are capable of making concrete change in the world around them. I believe that the time we spend getting to know the

land at Habitat, caring for it at all-camp morning, and playing games where we act out being organisms and really empathizing with them all laid a foundation of care and connection for this action. In games and in the picture books we read, we talked about how people can build bat boxes and monitor traffic when salamanders need to cross roads to get to vernal pools. I believe that those stories of people, especially kids, taking action made the act of replacing trees both feasible and desirable in Martin's mind.

My most outgoing, high-energy camper Martin was especially interested in fighting directly against people who hurt nature and destroying environmentally damaging infrastructure. I believe that there was an element of pushing the boundaries of our camp group in the choice to bring up these ideas. Martin took a large stick with pinecones and birch bark on it and named it their Stick of Power. They carried it around for a full camp day, saying that they were going to use it to "destroy every paved surface in the world." I encouraged this idea by talking to them about some of the permeable pavement options that we could use to replace the infrastructure that they destroy. They did not take any action on destroying paved surfaces at camp, which Mass Audubon probably appreciated. I hope that in a few years, with an understanding of some of the mechanisms of how changes like depaving can actually happen and be maintained, Martin will try to change the world in this way.

The skit "Habitat Condominiums" became a central focus of our unstructured conversations for several days after it was performed. It features a villainous real estate developer officially named Mr. Cheatum (of the company Dewey, Cheatum, and Howe). The kids misunderstood his name to be Dewey Cheatum, and that is how we referred to him in all of our discussions. In our collective imagination, Dewey Cheatum became the epitome of evil and climate catastrophe who we need to work together to defeat. The kids talked about how it's illegal to develop protected lands, and how they are glad that police would stop Dewey Cheatum if he tried to build on Habitat in real life. They also had a lot of extrajudicial ideas, like kidnapping Dewey Cheatum, suspending him over a pit of venomous snakes, and/or assassinating him. I was happy to entertain and engage with them, asking questions like, "How will you get away with it without going to prison? What will you do when another developer takes his place?" The

kids did not have answers to these questions yet, but I hope that providing space for them to talk about a diversity of tactics, including socially unacceptable and illegal ones, will push their critical thinking and help them make brave but smart and effective decisions about the actions they take in the future. The story that they were telling, the one in which they take action to defeat Dewey Cheatum and save the forest, is an example of action-oriented critical hope.

Passing Between the Representation and Reality

Underlying all of my lessons was the intention to provide students space to build both emotional connections to the land and their own agency over the world they live in, on the micro-scale of the games they play and on the macro-scale of building a livable world. I modeled exercising agency over our group activities to the students by changing the rules each round, then invited them to do so, and then allowed them to change the rules and structure of our group activities even when they were not invited to do so. The time and energy we spent building their agency in the imaginary, representative worlds of the games we played will increase their comfort with exercising autonomy and agency in the real world.

When a kid playing the Bird Migration Obstacle Course says, “Let’s take away a hula hoop!” do they mean “let’s make the game more challenging for fun,” or do they mean “let’s grapple with the effects of habitat loss on migratory birds”? When a kid says, “I’m going to assassinate Dewey Cheatum,” do they mean “I’m going to enter this fictional world as a triumphant hero” or do they mean “I am willing to take direct action, at great social and legal risk, so that my ecosystem and I can have a future”? Both, I think. One may come first, and one may be dominant, but neither representation nor reality exists without the other once the link is made. The seed of the idea has been planted. When kids make jokes and play and engage in fictional worlds related to the climate, that is arguably *more* important and formative than if they were engaging with serious, academic climate information. This is how they learn. This is how they construct their relationships to reality.

Out of all of the activities we did together, the one that I found most intriguing was the Atmosphere Game, which we played on the second Monday of the first session. The game, as written, is very teacher-centered and serious: we have a chalk circle representing the earth and a chalk circle for the outer edge of the atmosphere. Some kids are carbon dioxide molecules, trying to tag and thereby "trap" some of the other kids, who are sunbeams trying to pass from outside of both circles to the center and back out. The game cycles through rounds of tagging, rounds of discussion where we increase the number of taggers and make predictions about how it will change the number of sunbeams that get trapped on earth. It's a more earth systems science game, and less of an ecology game. Where we usually have kids playing as animals in a specific habitat, they are instead playing as molecules and energy on a global scale. There is much less room to be silly, and less room to tell stories with compelling characters.

The kids felt this, and chose to change the game. Gus sat down in the center of the playing field, on the "earth," said that they were a wooly mammoth, and started making really loud, goofy wooly mammoth noises. They demanded a new way to engage with the game: not discussion, not tagging, not trying not to get tagged. Just sitting and making big noises and contributing chaos and humor. They filled a gap in the game: the emotional connection to the living things. The earth is more than just a chalk circle with a certain amount of heat energy, it's a home for a specific ecosystem. The point of the game is not determining exactly how much carbon dioxide we need to have the perfect global temperature, the point is life. The kids' chaos and goofing off brought it life. It is easier to care about the fate of an ecosystem when it's represented by one animal, and easier to care about an animal when they're physically represented by your friend sitting on the ground laughing in front of you.

As in-game time passed and I announced that we were approaching the modern day, the kids changed their representation to match their knowledge of the real world. One said that we needed a gorilla to represent that primates have evolved, and that we couldn't have a wooly mammoth anymore because they went extinct. Another said that we could keep the wooly mammoth because real-life scientists are working on bringing them back from extinction right now, so we ended up with two kids (Gus and

Martin) sitting in the center being silly while the rest continued playing. We played one round where nearly everyone got tagged, so there was too much heat energy trapped by the atmosphere, and the earth was too hot to support life. In the next round, the kids chose to decrease the number of taggers to "balance the world." For our final discussion, I connected our game representation back to the reality of the global climate by asking "How did we balance the world? What can we do to take carbon dioxide out of the atmosphere?" The kids were able to shift very fluidly back to talking about real-world reforestation that they had learned about from MrBeast. I believe that being able to act out, and even become, a silly representation of animals that they care about and are emotionally attached to in reality helped the kids discuss climate change in reality, with the serious attention that it deserves.

This is only one example of a near-constant process of switching back and forth between asking representation-based questions like "how many popsicle sticks need to be on the ground for everybody to get 5?" to reality-based questions like "how much protected land does the United States need to support migrant bird populations?" Kids' expertise in designing the most fun game possible translates fairly easily onto the biggest scientific and political questions of our time. In my experience, kids have greater flexibility of thought and big radical imaginations, both qualities that the climate movement desperately needs in order to sustain itself and grow. I am so grateful to my campers for having the empathy and creativity to bring a fun, emotional connection to animals into the game. I am proud of the solution they developed together through conversation to "balance the world."

I never heard them bring up moving to space or the irreversible climate tipping point again after that first day at camp. The joy and hope of pulling up invasive species at all-camp morning on Friday and playing the Atmosphere Game on Monday felt like the halfway points of the session. We had come a long way from day one and begun to improvise together as a group. The kids were able to talk about their hopes for global-scale climate futures, in which the world is balanced, and they were able to work with their hands and experience empowerment. While I don't think that the hope and happy endings that our games provided for the kids will erase their understanding of how close we are to climate collapse, I do

think that they will help the kids figure out what to do about their fear of climate collapse. Now, they have two visions: everyone moving to space, and everyone balancing the earth and being able to stay.

The "How" of Educating Climate Activists

Education empowers these children to practice stewardship of the environment when the curriculum focuses on stories, individuals with whom the students have an emotional connection, and/or games. These practices are developmentally appropriate and help teachers work with kids' natural relationship-building, curiosity, and play, rather than against them. I think that Habitat excels at this: a standard day of camp for 4 - 9-year-olds involves reading at least one book *and* watching a skit or puppet show that tells a story about animals, plants, and ecosystems. Often, the book and skit/puppet show are carefully selected to introduce concepts, cycles, and individual organisms that will be featured in the games and activities done later. The structure of centering every day around one theme helps campers build an extended understanding and an emotional attachment to the living things that they are spending the day with. There is very little direct instruction at Habitat; all lessons involve much more collecting, running, sorting, discussing, building, and acting than listening to a teacher lecture. The games that we play activate kids' brains and bodies to solve problems, experience the real world, and work collaboratively in a way that watching, reading, and listening simply cannot. Play is an indispensable tool for teaching hope, agency, and justice to kids.

I watched this unfold when Gus and Martin became incredibly invested in a game called Forest Fragmentation because they had chosen to play as a wolf pack, where they pooled their chances for survival together. Both their ability to choose and the emotional connection they formed to the animal that they played as strengthened their learning – they were deeply engaged and invested in surviving because they had become their characters. I remember the feeling of fear when in danger of being tagged, and of

pride whenever I "survived" a game, from my childhood. Those feelings made the lessons that the games were teaching stick in my head and my heart.

Another game which had an emotional edge was Macroinvertebrate Mayhem, a variation on fishy fishy cross my ocean. Two children are "environmental stressors" like pollution, and they try to tag the other children, who are aquatic invertebrates, as they attempt to cross from one safe zone to another. The children are assigned necklaces that tell them which species of invertebrate they are and how they must move from one safe zone to another. The pollution-tolerant species are allowed to run, but more sensitive species might be required to hop, spin in circles, or do a push-up on every third step to slow them down and make them easier to tag. After each round, the teacher facilitates a conversation about which species are being tagged the most, and what it means for the ecosystem when there are no members of a species left in the pond. The campers mourned the last person to be tagged from each species, much more than they would a simple informational reading about the same topic. I remember the feeling of being swept up in the story when I was a 6-year-old watching my teachers act out *The Lorax* by Dr. Seuss, and being engulfed in a game when I was a 9-year-old playing the role of a hawk, frantically trying to tag a group of my friends who represented grasshoppers in a massive hiking and running game. The memory of those feelings makes me feel pained whenever I read about planned deforestation, and moves me to stand in the way. I am glad that this new generation is building the same connections.

Education empowers these children to practice stewardship of the environment when every lesson ends with hope. This is generally the case at Habitat, but making a conscious effort to end every lesson with a concrete, emphatic message of hope made me notice that in many lessons (taught by myself and others), hope can get lost in the central conflict of the activity, or in the rush to transition to something else. I found myself slowing down to not only ask the kids, "See how much easier migration was for you when we had sanctuary spaces set up?" but to ask them, "What do we need to do in real life to make sure that birds can migrate safely?" and re-emphasize the possibility for action outside of the game. During the final round of the game, the kids shared their ideas on how to make the game as easy as possible, and we

connected that to the way that humans could make migration as easy as possible for birds, and then we acted it out. They got to end the game feeling like they had won, like they had all succeeded, and empathizing with how birds may feel when they migrate through a world designed to support them and keep them safe. Based on the different energies that my 7-year-olds and 8-9-year-olds brought to the Birdstacle Course, respectively, I think that these real-world messages of hope may feel more like happy endings to fictional stories for younger kids, and more like calls to action for older kids. Whichever way they process the information, ending every lesson with hope is an important safeguard against climate anxiety and doomerism.

Education empowers these children to practice stewardship of the environment when it follows and responds to student prior knowledge, interests, skills, and energy levels. This is another area in which I think Habitat ranges from okay to excellent, depending on the teacher and the demands placed on them. When I was rushing to get the kids to lunch on time, or when my attention was split between the whole group and one child's challenging behavior, I was not able to be as flexible or individualized in my teaching approach. However, on a good week, when I know the kids and my co teacher well, I am absolutely able to select activities in advance that I know match my campers' interests and energy levels, and even to pivot in the moment to low- or no-material activities that weren't in the original plan. For example, I think the Atmosphere Game was only successful because I noticed that the group had very high energy beforehand, and I had them play 15 minutes of a running game that they already knew and loved beforehand, so that they would get enough energy out to be able to listen. Habitat has no pretests or structured way to measure prior knowledge, so we teachers learn what our kids already know through informal conversations and the discussions that launch our games like the ones that I recorded in my field notes.

At the end of the second session, my camper Sonam's main piece of feedback was that he had learned all of the content in his past two years at camp, but there were other campers for whom all of it was new and who weren't grasping the foundational concepts that I would want them to before moving

on. With a more systematic approach to measuring what our campers already know, we could tailor the curriculum to them even more closely. I don't think that the solution is separating kids by how much they know or how many times they've been to Habitat before. Rather, I think that we should be intentional about providing more opportunities for campers to teach each other – for example, Sonam brought up coral bleaching during the Birdstacle Course game because he was excited about it, and the rest of the group got to learn from his explanation. While children with different levels of background knowledge can have takeaways that are all valuable despite being different and varied in their complexity, I'm also wondering if there are more ways to differentiate our games and lessons.

Education empowers these children to practice stewardship of the environment when it provides realistic, concrete models for how change happens. This is the area in which I think Habitat, and my personal repertoire of educational activities, is the most lacking. Most of our games present solutions as simple and one-dimensional, appearing in our conversations as "build more animal sanctuaries" or "ban pollutants," not as an explanation of how those things happen. We are not setting aside enough time and space for the fruits of kids' radical imaginations to grow and become detailed and specific. We have books such as *Amara and the Bats* and *She's Wearing a Dead Bird on Her Head!* which explicitly detail the steps that some individuals have taken to concretely change the world. Those stories create emotional connections, but there is still a gap in our curriculum where we could have games that help kids practice and act out the process of creating a new law, or taking direct action to protect or reclaim land from developers. I believe that Habitat's environmental education needs to be supplemented by kid-friendly political education in order to maximize kids' ability to take effective climate action. A group challenge to plan a protest or blockade against a teacher who pretends to cut down a tree could be a simple start to this. A more detailed obstacle course could prevent kids from getting a bill of their choice passed into law. I believe that the joy and creativity that kids bring to acting out being migratory birds can also emerge from acting out being rebels and organizers. We just need to give them time and space for it.

Conclusion

Theoretical implications

I hope that this work will add to the voices of educators who are advocating for an end to separation between the study of play and the study of learning, or between jokes and serious talk. In her piece "If the Sun Isn't Alive," Cindy Ballenger uses the phrase "serious playfulness," to describe similar conversations to the ones that I had about violent resistance to climate catastrophe with smiling, laughing children. She asks, "How did a child's joke help children learn an idea in science?" Questions like this one must become commonplace in our classrooms, so that we can stop fighting against the silliness, socializing, and storytelling that naturally help children learn, and instead work with them. Children play by acting out and imagining both reality and alternate realities, both possible things and impossible things. They play with the ideas that puzzle them, the ideas that scare them, and the ideas that bring them joy. Often, all three of these categories overlap in play. Through play, children learn by experimenting with various possibilities and scenarios. Their ideas interact with each others' and they change each others' perceptions of reality. Educators have a responsibility to integrate play in the classroom. When we do, we generate emotional connections to content, foster radical imagination, nurture hope, and enable children to practice their agency.

Elementary schoolers should not be limited to the false, oversimplified sense of hope that comes from downplaying or ignoring tragedies. The ability to leverage critical hope for action does not emerge as kids grow up, it exists in kids of all ages, from birth. In fact, I see far more radical imagination, more daring ideas, and more excitement about doing something in my 7- and 8-year-olds with their Stick of Power, their hands full of invasive plants' burrs, and their visions of many wildly different futures.

Practice implications

When tackling difficult subjects with kids, we need to center play, storytelling, and emotional connection in our lesson plans. Lessons that are developmentally appropriate are not necessarily ones that hide the severity of the problem, but ones that allow kids to physically move through their feelings and collectively imagine hopeful futures. Critical hope was initially theorized in work with high schoolers, and while it looks different with elementary schoolers, it is essential for them as well. With younger kids, it becomes more essential to teach difficult subjects through play, because it is by far the most natural and powerful tool that kids have for connecting with each other and with material. When they're moving, laughing, and using their imaginations is the time that kids are most resilient and able to confront difficult information. I strongly recommend many of the lessons in the Project WET and Project WILD curricula. These are reservoirs of games and activities developed by a nonprofit and a U.S. government agency, respectively, that form the foundation for a lot of Habitat's curriculum. As educators of a generation that will live to see more climate catastrophe than we will, we have a responsibility to center our children's needs and desires over our own. We have a responsibility to teach both ecology and the ecosystem of tactics for social change, together, to everyone, at every age. No information can be taught in isolation from other disciplines, and no person can learn in isolation from other beings. Take the kids out to the woods, play together, and talk to them about the difficult truths of our time.

The 10 years I spent as a camper and the 5 years I spent as a teacher at Habitat have made me a game-based learner and a game-based teacher. I enter the classroom prioritizing emotional connections between learners and to the content, seeking fun, curiosity, exploration, and experimentation. In middle school, my friends and I created and used fantasy maps to talk about violence, crimes against humanity, and ecosystem collapse. As a teacher, even in traditional classrooms, I find myself entering students' joking-world, their imagination-world and connecting it to the thing we're supposed to be learning, rather than shutting them down and forcing them to learn in academic-world or reality-world. When something

is too big and frightening to address head-on, we have to joke about and play with it. The alternative is numbing ourselves and turning away.

Limitations

This is a very specific demographic that should not be generalized to all kids. One of the first pieces of feedback I got on this paper was that all of my guiding questions talked about "kids," when they were not really about kids in general, they were about *these kids*. This is not an objective representation of reality, it is an account of how I experienced reality in the specific time and space of Habitat Camp, 2023. If I had the time and energy, I would love to extend this project by including teachers of other groups of kids and their field notes and reflections. Repeating this project with the same kids for several years would yield very interesting results. Very few comparisons can be made based only on this research because I had so little control over the groups included and their makeup. Future research could work with more diverse ages and/or kids from different backgrounds. We could also explore the effects of different teachers and different lesson plans. I believe that it is also worth exploring how other age groups, including adults, not only children, learn about the climate crisis through play.

Closing

This work has convinced me that play is an invaluable and underutilized tool in all education, especially in education about political and distressing topics. Humans, not only children, are wired to socialize, storytell, and imagine in order to learn and interact with each other and the world. If we want to teach stewardship or any other topic, we need to create spaces in which people can play to build emotional connections, play to exercise their own agency, play to build hope, and play to imagine a better future. Teachers need to see themselves as facilitators, rather than commanders of learning. The understandings, questions, and ideas that learners bring into the space need to be the foundation of the learning that

participants co-create. Through these methods, we can grapple with crises, imagine ways to overcome them, and even begin to take positive action in the real world.

The Habitat alumni that I mentioned in the introduction still have many more years in which they can cause good trouble for climate. I am so excited to get to watch them live through and learn from the flaws in conservation science, in electoral politics, and in autonomous direct action movements. I believe that they will continue to refine and expand all of these fields towards climate action and justice.

What will you do? How will you set aside time and energy to build your own radical imagination? How will you exercise critical hope, and what actions will it lead you to take? What do you need to learn in order to enable you to contribute more? What will you contribute to youth liberation? What will you contribute to climate justice? What part of this world will you help destroy, and what part of the new world will you help build?

References

Bogdan, R. C. & Biklen, S. K. (1982). “Qualitative Research for Education: An Introduction to Theory and Methods.” Pearson. Pp. 117-129. Bogdan & Bicklen, pp. 117-129, and Appendix B

Craps, M., Grieten, S., & Bouwen, R. (2016). Co-Creating the Future Now. In V. Achten, G. Bouckaert, & E. Schokkaert (Eds.), *“A Truly Golden Handbook”: The Scholarly Quest for Utopia* (1st ed., pp. 248–262). Leuven University Press. https://doi.org/10.2307/j.ctvgd2vn.21

Dhara, C., & Singh, V. (2021). The Elephant in the Room: Why Transformative Education Must Address the Problem of Endless Exponential Economic Growth. In R. Iyengar & C. T. Kwauk (Eds.), *Curriculum and Learning for Climate Action: Toward an SDG 4.7 Roadmap for Systems Change* (pp. 120–143). Brill. http://www.jstor.org/stable/10.1163/j.ctv29sfv6v.14

Duncan-Andrade, Jeffrey M. R. (2009). “Note to Educators: Hope Required When Growing Roses in Concrete.” *Harvard Educational Review.* Vol. 79 No. 2 181-194.

Fleischer, A. (2013). From Theory to Practice: How Mass Audubon Is Incorporating Strategic Framing about Climate Change. *The Journal of Museum Education*, *38*(3), 273–278. http://www.jstor.org/stable/43305007

González, E. P. (2021). Toward Education for Sustainable Development: Lessons from Asia and the Americas. In R. Iyengar & C. T. Kwauk (Eds.), *Curriculum and Learning for Climate Action: Toward an SDG 4.7 Roadmap for Systems Change* (pp. 291–308). Brill. http://www.jstor.org/stable/10.1163/j.ctv29sfv6v.25

Kelley, Robin D.G. (2003). “Preface.” *Freedom Dreams: The Black Radical Imagination*. Beacon Press.

Kimmons, R., & Caskurlu, S. (2020). The Students’ Guide to Learning Design and Research. EdTech Books. https://doi.org/10.59668/10

Osaka, Shannon. “Why climate ‘doomers’ are replacing climate ‘deniers’.” (2023). The Washington Post.

Pearson, B. L., Russ, S. W., & Cain Spannagel, S. A. (2008). Pretend play and positive psychology:

Natural companions. The Journal of Positive Psychology, 3(2), 110–119. https://doi.org/10.1080/17439760701760617

Project WILD, Western Association of Fish and Wildlife Agencies (U.S.), & Council for Environmental Education. (1992). *Project WILD : K-12 activity guide* (2nd ed., rev). Project WILD.

Project WET. (2011). *Project WET Curriculum and Activity Guide 2.0.* Project WET Foundation.

Reynolds, Emma. (2021) *Amara and the Bats.* Atheneum Books for Young Readers.

Roemhild, R., & Gaudelli, W. (2021). Climate Change as Quality Education: Global Citizenship Education as a Pathway to Meaningful Change. In R. Iyengar & C. T. Kwauk (Eds.), *Curriculum and Learning for Climate Action: Toward an SDG 4.7 Roadmap for Systems Change* (pp. 104–119). Brill. http://www.jstor.org/stable/10.1163/j.ctv29sfv6v.13

Seuss. (2012). *The Lorax.* New York, Robin Corey Books.

Sharma, R. (2021). Learning to Recycle Isn't Enough: Youth-Led Climate Activism and Climate Change Education in the UK. In R. Iyengar & C. T. Kwauk (Eds.), *Curriculum and Learning for Climate Action: Toward an SDG 4.7 Roadmap for Systems Change* (pp. 144–166). Brill. http://www.jstor.org/stable/10.1163/j.ctv29sfv6v.15

Starr, Lisa J. "The Use of Autoethnography in Educational Research: Locating Who We Are in What We Do." Canadian Journal for New Scholars in Education. Volume 3, Issue 1. June 2010.

University of Florida, & Fichtman Dana, N. (2016). The Relevancy and Importance of Practitioner Research in Contemporary Times. Journal of Practitioner Research, 1(1). https://doi.org/10.5038/2379-9951.1.1.1034

Westera, W. (2019). Why and How Serious Games can Become Far More Effective: Accommodating Productive Learning Experiences, Learner Motivation and the Monitoring of Learning Gains. *Journal of Educational Technology & Society*, *22*(1), 59–69. https://www.jstor.org/stable/26558828

Zosh, J., Hush-Pasek, K., Hopkins, E., Jensen, H., Liu, C., Neale, D., Solis, S., & Whitebread, D.

(2018). Accessing the Inaccessible: Redefining Play as a Spectrum. *Frontiers in Psychology*, *9*.