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When the Land Whispers: Engaging Geographic Consequential Learning with Indigenous Hawaiian Youth

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Abstract

Between Hawaiian communities and tourists there exists a dynamic tension of boundaries and welcoming. While Hawaiians welcome the tourism that fuels the local economy, they rightly demand respect for their lands and sacred spaces. Rather than a symbiotic relationship of mutual benefit, rising tourist vandalism and disrespect has led to substantial discord between entitled visitors to the islands and those who live and steward the land. This paper shares one Hawaiian community's efforts to design and implement a community centered, geographically responsive curricular project known as the Advocacy Apps, a set of youth designed and constructed phone applications that inform tourists of the rich histories and expected codes of conduct in Hawaii's wahi pana, or sacred spaces. Using the dual lenses of consequential learning and rightful presence, this paper explores youth agency within a design process that centers their community, culture, geography, and temporality. Through a series of vignettes of student experiences, we explore the ways in which student rightful presence can be fostered through explicit design choices.

Introduction

Kalani, standing in her back pasture, waves down the three tourists. Her young daughter, Maleeka, wanders nearby collecting taro leaves for her wreath. "Hey, listen, that path to the beach is public land, neh? But this is our private property. You can't walk here. And don't use it as a toilet. Someone must clean that up. You can't just do that on my land." The tallest of the men closed distance on her so rapidly it startled her. She backed away as she saw him pick up a stick and snap it across his knee as he approached her, trespassing further onto her land. "Or what?" he said to her. "Nothing." She picked up her daughter and retreated to her house, locking the doors and grabbing her phone. But who would she call? Deep in the Waipio valley, the police could not come quickly, and her husband was further away on their land harvesting taro.

Between Hawaiian communities and Hawaiian tourists there exists a dynamic tension of disdain and need. The island's economy, brutalized during the COVID-19 pandemic, is fueled by tourism. However, rather than a symbiotic relationship of mutual benefit, there exists growing tension and anger between Hawaiians and the people that visit the islands. Visitors come to the islands expecting unfettered access to the land they have paid to come see. Hawaiians want their land, culture, and sacred spaces respected. Kalani's true story as

an Indigenous Hawaiian landowner in the Waipio valley showcases the ways in which visitor privilege and land rights are coming closer to violent conflict on the Hawaiian Islands. Her story is not unique; instances of problematic tourist behavior are rife on the island. From attacks on local wildlife (Jones, 2022) to a tourist publicly urinating on Mauna Kea (Dukelow, 2022), one of the most sacred sites on the island, there is a forceful conversation happening on the big island of Hawaii about how to engage with tourist behavior. As the Hawaiian tourism authority noted in a press release, "One of the challenges in measuring the work in visitor education is that it is hard to quantify how many turtles were not harassed. It is hard to quantify how many visitors did not commit a disrespectful act" (Dowd, 2023).

Within this context of rising tourist vandalism and broader disrespect of sacred Hawaiian spaces, this paper shares an educational design approach for fostering youth agency through the design of culturally and geographically responsive curricular projects. Specifically, this paper focuses on the design process and student experiences building "Advocacy Apps," app-based programs intended to inform and guide tourists in the appropriate ways to behave within Hawaii's *wahi pana* (sacred spaces).

Background and Context

The big island of Hawaii is home to the Mauna Kea, the largest volcano in the world and a deeply religious and sacred space to Indigenous Hawaiians [1]. Currently there is a battle between local community members and science companies who are eager to build the new thirty-meter telescope (TMT) on the mountain side. This desecration of native lands has been met with great public outcry and protests from Indigenous Hawaiian groups (Lam, 2019). Because mainland companies have developed telescope observatories on the island and founded local offices, the last 20 years have seen a substantial increase in the number of white families. This change is evidenced in the rapidly increasing town median income, which went from $51,150 in 2000 to $97,883 in 2019 [2]. However, while median income has increased, the rate of poverty is not equally distributed or experienced. Indigenous Hawaiians experience an overall poverty rate four times higher than their white counterparts, with nearly 25% of Indigenous Hawaiians in the area living well below the poverty line. This racial and economic divide serves to heighten the challenges and frustrations with tourists felt community wide.

In addition to conflict between white and Indigenous Hawaiian communities on the island over the TMT, an additional set of geographic and epistemic conflicts are arising between all residents of the island and tourists. Since the uptick in social media and influencer travel to Hawaii, there has been a great deal of conflict over tourist behavior on the islands that is seen as destructive and disrespectful. Kalani's story that is shared at the start of this piece is a real story told by a landowner in the Waipio valley. These stories are not atypical and often reflect an overwhelming sense of entitlement on the part of tourists when faced with constraining their wants in deference to the rules and laws that govern the spaces they visit. It is this rising conflict that sits at the center of this paper.

The current socio-political climate on the island shapes socio-scientific learning across communities. On the big island of Hawaii is the town of Hau'oli (pseudonym). Hau'oli has nearly 10,000 residents countywide and is two hours from each of the island's small cities and hospitals. The town is the historic home of *paniolo* culture, early Hawaiian cowboys that emerged on the island in the late 1790s when cattle were first brought to Hawaii as gifts for King Kamehameha. Additionally, the geographic location of the school of focus is considered rural by the Veterans Administration. 40% of the American population lives in

rural and semi-rural communities. Despite this, research on rural education is sparse, particularly within STEM. Low-income students in rural communities in the US are far less likely than their non-rural peers to take high school science courses (Google & Gallup, 2016). They also have less access to technology outside of schools (Kena et al., 2016). Similarly, just 30% of rural students had access to any computer science course and only 15% had access to Advanced Placement computer science (Change the Equation, 2015)—Advanced Placement courses are equivalent to university-level courses that improve acceptance rates into selective universities and reduce the cost of university attendance. There is a need to provide opportunities for low-income, rural students to engage meaningfully with authentic STEM learning opportunities that include computing and provide access to future STEM workforce opportunities (Hofstein & Lunetta, 2004; Weintrop et al., 2015). However, these students often lack access to resources, are from segments of the population underrepresented in STEM, and have teachers who are underprepared to implement STEM content effectively (Cowen et al., 2012). With this Hawaiian rural education landscape and prior knowledge of the youth within the community as the basis of understanding, we designed a culturally responsive maker curriculum that was to be taught in a summer school class on the big island of Hawaii.

Positionality Statement

The authors are both white individuals from outside of the community in which we conduct research. It is our goal to elucidate the multifaceted truths surrounding identity and community in collaboration with those we work with. With over 15 combined years as lead classroom teachers and 8 years partnering with this community, we attempt to bring a deep understanding of progressive education practices. This paper explores interconnected communities impacting the experiences of the individual, emphasizing the collaborative role of educators as co-creators rather than leaders. The focus is on creating spaces of rightful presence for youth, acknowledging their voices, ideas, and plans within the learning community. Youth empowerment is defined as the ability to make suggestions, enact ideas, and override adult authority, fostering a space of equality and democratic processes in the classroom.

Theoretical Framing

This paper, and the design process on which it reports, is framed through converging primary and secondary frameworks. First, we engage Calabrese Barton and Tan's (2019) framework of *rightful presence*. The camp and the Advocacy App project were designed with the explicit goal of fostering Hawaiian youth rightful presence. By supporting youths' rightful presence, we seek and support a deconstruction of the power structure within traditional school spaces that obfuscates and erases youth identities. Early in their schooling, young children, and most especially children of color, come to understand that the classrooms they inhabit are not their own. The rules are set by adults. Their bodily functions are gate-kept by adults. Adults broker who speaks, who is correct, and who has capital within the schooling space. Even the discursive practices of the classroom reflect the teacher more than the students (e.g., Tytler & Aranda, 2015). The typical referential name used for classrooms showcases this power dynamic as we typically call it "Mrs. Smith's room" rather than "the fourth-grade room." Ownership and stewardship over youth space, youth bodies, and youth experiences are given over to the educator. As they age, students see their spaces become less and less their own. By middle school, their art is no longer on the walls. They rotate classrooms and they switch desks. They are, in one-

period increments, transient visitors in the teacher's space. Worse, they often fail to see themselves and people like them as meaningfully present within the curriculum (Tofel-Grehl, 2023). Being absented from the space and the curriculum in these ways fosters an erasure of students of Color, who do not typically see teachers of their own ethnicities within their classrooms.

Through rightful presence (RP), Calabrese Barton and Tan (2019) call for the deconstruction and reconstruction of power structures within schools with particular attention to those structures that foster the erasure of youth's identity. Engaging in this intentional process of restructuring involves three specific foci. First, to be rightfully present within schooling, the rights of youth cannot be negotiated, brokered, or given by adults. For students to be rightfully present in their spaces, they must have the power themselves to define their own rights and roles. The very notion that rights can be conferred by those in power is anathema to rightfully present space. For if the marginalized receive their rights through the benevolence of those in power, they are actually privileges that can be revoked in the same manner. The second focus of rightful presence is to make visible the political struggles of minoritized individuals that are central to the community. We cannot conceptualize science as a neutral set of information that is unrelated to the disenfranchisement of marginalized groups, because scientific activities are too frequently associated with such disenfranchisement. Accepting scientific neutrality would be to ignore the struggles of Indigenous communities. For example, teaching astronomy on the big island while failing to discuss the land struggle Indigenous Hawaiians are experiencing over the forced building of the Thirty Meter Telescope on the Mauna Kea, the holiest site on the island, would be to ignore the lived realities of many students within the classroom. Rightful presence seeks to make those struggles visible and explicit within the classroom as part of natural classroom learning. The final goal or focus of rightful presence is to actively dismantle the power structures that work to erase youth identities. Acknowledging oppressive structures and struggles is necessary but not sufficient for rightful presence. For rightful presence to be established, we do not simply acknowledge the struggle. Instead, we actively work to dismantle the structures of oppression that marginalize students and erase their full identities from the learning space.

While centering the three foci of rightful presence central to the design process of this work, we also engaged a second convergent framework that centers youth experience. We make sense of student engagement with geography and issues of land equity through the lens of *consequential learning* as laid out by Hall and Jurow (2015). Consequential learning engages in examining the practices and discourses that can restructure relationships, people's understandings, and the ways they interact within and across communities. Through consequential learning experiences, individuals can carry novel understandings between and across contexts to transform both practices and discourse on issues that are important to them. Designing curriculum and learning experiences for consequentiality requires situating concepts within both the instructional environment and personally-relevant contexts to engage preexisting schemas and understandings that anchor learning within meaningful personal and community contexts.

Hall and Jurow (2015) explicitly reference both classroom and community-based designs for consequential learning. For example, they highlight socially-designed urban space development. Atypical of urban design strategies, this experiment involved architects, urban designers, and—most importantly—young people. This unique social design afforded discussions on racial and spatial justice and youth input via bicycle workshop and mapping activities, which led to actual changes in city streets. This example of

consequentiality illustrates the importance of understanding historical circumstances, identifying genuine needs, and creating new possibilities through collaborative design practices. Within our context, Hawaiian youth not only need a voice for describing the injustices committed on sacred land, but a method of direct involvement in solution development.

For classroom design, Hall and Jurow (2015) found that putting students in the forefront of the conceptual practices afforded unique discussions. When field biologists evaluated student models that described fish populations, researchers observed lively discussions about the "use value" of student models. Rather than discussing how "good" the models were, students and professionals could evaluate how the model could be used and what alternative models could offer. In this way, the students were able to engage in practices that scientists and professionals typically engage with. They wrote, "recontextualizing models in design reviews was part of a conceptual practice with models that was common to the biologists and architects but not to the students" (p. 182). Instead of being shown what makes a good model, or good scientific practices in general, students were free to create and defend their own models and scientific practices, and consequently freely think about and decide what it is that a scientist does. Similarly, Hawaiian youth were able to design Advocacy Apps that required computational thought and skill. Students used code to tell their stories and could reinterpret the purpose and utility of computer science.

Our prior work with students further informed our framing, as youth in this community have previously told us that the content of their learning comes from the mainland and is not for them (Tofel-Grehl, 2023). With that as our localized understanding, it was essential to center geographic and cultural advocacy through consequential learning as it converges with rightful presence. Through the empowered participation at the heart of rightful presence, consequentiality can be achieved; consequentiality of learning comes from the legitimacy of the rightful presence. Likewise, a lack of rightful presence prohibits consequential learning, as no human can learn where they are excluded by design and structure.

With these framings in mind, we posit the following research questions:

1. How can we design a rightfully-present classroom space and curricular experience for students that centers their experiences and communities within their classrooms?
2. How do students engage in curricular codesign within a rightfully-present space? Do they demonstrate or articulate greater rightful presence and consequentiality of learning as a result?

Methods

School Setting

Hau'oli Middle School (HMS) is located in the central part of the big Island of Hawaii, meeting the US federal and state designations for a rural school. 72% of the students at the school receive free lunch, a US program for students of families living in poverty. Over 52% of the students identify as Indigenous Hawaiian with another 25% identifying as biracial Hawaiian. COVID-19 associated budget cuts have been particularly severe at the school, resulting in staffing challenges such as the consolidation of Language Arts teaching positions into other core curricular areas.

Description of the Teacher

During the summer of 2021, students at HMS were invited to sign up for a STEM, Culture and Community class. The class was co-designed between the lead author and the school's middle school social studies teacher. The teacher, Mrs. Kewl is national board certified in both science and social studies and has been teaching at the school for 8 years. She also taught previously for an additional 15 years on the mainland. Her goal in designing the curriculum was to find a way to engage science and technology to support youth awareness and activism on the island.

Description of the Summer Class

The class spanned two weeks during the summer of 2021. Class met for four hours per day and included two place-based field trips to sacred sites on the island. The class engaged in three culturally-responsive maker projects. This paper focuses on the design of the third and final project, the *Advocacy Apps* project. Field trips were intentionally designed as place-based experiences that would engage youth in learning about and working with localized spaces as part of their learning.

Advocacy App Project

The project builds off two geographically-centered, place-based learning experiences for students during the camp. During the first week, the class visited the Waipio valley, the sacred childhood home of King Kamehameha and popular tourist location for its beautiful views. While the Waipio valley beaches are public, the land surrounding them is not. Students went to the Waipio valley and interviewed the land caretakers about their experiences with tourists. In the second week, students took a field trip to the Pu'ukohola Heiau. Heiaus are deeply religious sites to the Indigenous Hawaiian people. Pu'ukohola is still used for religious practice today. Again, youth interviewed the caretakers to develop their understanding of the needs of the space.

Youth then reflected on the importance of advocating for sacred spaces in Hawaii, especially given the recent uptick in vandalism from tourists. To help combat this problem, youth designed, constructed, and coded apps to serve as guides for visitors regarding appropriate behavior on the island at its sacred spaces. This process spanned 4 class sessions or approximately 16 hours.

Data Sources

Several data sources were triangulated for this analysis. Included in this analysis were photographs of youth artifacts, class transcripts, fieldnotes, and interviews. A total of 40 hours of class time were transcribed for inclusion in this analysis. Additionally notes, emails, and documents exchanged between the lead teacher and lead researcher were included for analysis.

Analysis

Open coding of data was engaged with *rightful presence* and *consequential learning* as dual lenses for making sense of youth design engagement. We sought to better understand how possible it was to leverage the affordances of technology to center justice and community. Findings are presented in response to each research question.

Findings

RQ1: How can we design a rightfully-present classroom space and curricular experience for students that centers their experiences and communities within their classrooms?

The research team specifically laid out a curricular design process that centered the core foci of rightful presence. The teacher and lead researcher engaged in a six-step design process intended to scaffold the development of a rightfully-present space and curriculum (see Table 1). In the first step, we identified core values and beliefs about science learning and equity that would drive the design process. Secondly, we reflected on classroom practices and structures that could potentially detract or hinder the rightful presence of youth within our classroom community. Thirdly, we brainstormed possible solutions to help foster rightful presence despite those barriers or, whenever possible, dismantle those barriers. When possible, we established alternative structures or processes that supported our core values. Fourth, we deployed the curriculum with students to begin the active codesign process with them. We engaged in collaborative curricular design that allowed us to build and model justice centered learning within our restructured summer learning community. In step five, we solicited feedback from youth that informed our larger design process and thinking. This process was generative and intended to bring youth into the process as codesigners rather than simply consumers of curriculum. They were engaged as the leaders and visionaries of next year's classes, able to shape both the experiences they had and those of future students. Finally, we formalized their ideas into tangible and actionable changes for the coming year's work. Through this process we designed, deployed, and iterated a justice focused technology project and curriculum for Hawaiian youth.

This design process was used to facilitate an environment of rightful presence in support of consequentiality. At each stage of our design and deployment process, youth voices were elevated and adult voices were quieted. For example during one of the early steps in fostering a space of rightful presence, our community developed and coauthored a group bill of rights. In this process, the voices of students were centered such that student goals and governance structures sat at the center of the community space development rather than those of adults. Students were centered in the feedback process and engaged as the leading, definitive voices. They tore at our initial ideas and plans, breaking them down and shaping them into wholly new ideas and spaces of their imagination. For example, when we were selecting the codes of conduct for the advocacy apps, the students navigated arguing with teachers about which practices and actions were supportive of our localized context and which were not. Arguing with teachers was new and difficult for students, especially when it came to issues of curriculum. We saw this challenge again when students wanted to learn more about the ways that the software pronounced Hawaiian words. We used student-centered feedback processes to elicit central information about ways to increase consequentiality through rightful presence.

Table 1. Design process for a rightfully present and consequentially just learning opportunity.

Step of Design Process/ Observation	Driving Questions	Design Decision and Reflections
Step 1: Define Big Beliefs and Goals 1. Rightful presence is essential for agency. 2. Hawaiian Culture and community centered	*What does RP look like in Hawaii? In Hawaiian spaces?* *In what ways can we center Hawaiian values & culture in the project design?*	Include local field trips and stories firsthand. Center on *wahi pana*. Allow youth to drive curriculum as much as possible. Scaffold open ended technology projects.
Step 2: Identify Barriers 1. Classroom rules prohibit agency 2. Curriculum is normally from mainland	*Can we get rid of classroom rules? If not all, can we get rid of any rules? Can we flip power structures?* *How can this curriculum be authentic to these kids in this time and space?*	Cannot get rid of all rules due to school policy. Engaged structure discussion and voting processes. Curriculum would be emergent while projects were more highly scaffolded. Space for youth re authorship and driving of school time.
Step 3: Brainstorm alternative structures 1. Classroom Bill of Rights 2. Coauthor curriculum with youth	*Given we cannot get rid of all rules, how can we author rules with youth?* *Given limitations of prep and materials, how can we coauthor with youth? What curricular structure is most open to youth RP?*	Coauthor classroom Bill of Rights with youth. Ratification and voting process agreed on as class. Build model projects and construction guides that are open and available to youth for modification and adaptation.
DEPLOY CURRICULUM		
Step 4: Reflect 1. Collaborative meetings to engage reflective curricular design practices.	*What worked? What didn't? What did kids experience? How can we improve experiences in relation to our big goals?*	Timing of lessons and projects was incredibly challenging the more we engaged youth choice and voice.
Step 5: Feedback 1. Youth meetings. 2. Interview youth in codesign modifications.	*What needs were not met?* *What would you want to be different next year?* *What do you want us to know?*	Kids loved the openness of the curriculum. Kids wanted more *wahi pana*. Kids wanted to decide what science topics they engaged in. Botany was considered an essential local topic.
Step 6: Formalize changes 1. Edit lesson plans and project descriptions to afford more time for youth design. 2. Add additional topics and classes for next summer	*What are our next steps?* *What can we do better?*	Spring semester *wahi pana* unit adopted in classrooms. Botany classes for the following summer.

RQ 2: How do students engage in curricular codesign within a rightfully present space? Do they demonstrate or articulate greater rightful presence and consequentiality of learning as a result?

Students engaged in codesign through their authorship and enacted agency during the build up to app design and construction. As students worked to make sense of the geographic oppression their island community experienced, they engaged their Advocacy App design and construction in two stages. Firstly, with an intentionally-designed focus on youth empowerment and justice, students created protocols and interviewed land caretakers to better understand the situation on the ground at two of Hawaii's most

popular tourist destinations. As part of our design process, our team felt that it was important for youth to collect their own data and draw their own conclusions about the geographic marginalization that Indigenous Hawaiian spaces experience at the hands of visitors. This put students in the proverbial driver's seat to determine what was central, what was important, and what was consequential to them. Doing so would allow students the ability to connect deeply with the realities of the impacts of tourists on the island. This deeper connection would support the consequentiality of their learning and further their own sense of rightful presence.

In preparation for the Advocacy Apps project, students went on two field trips to sacred sites on the island to interview the land caretakers. Students asked about their experiences with tourists and what they needed folks to know in order to make their jobs easier and honor the sacred spaces visited. We designed these experiences to maximize youth voice and empowerment central to rightful presence. Figure 1 shows sample questions from the interview protocol that youth developed and some of the answers they noted as important from the elder caretakers of the land. Youth engaged in codesign through this process of designing and enacting interviews because their questions were what they asked. They were the interviewers and the meaning makers; it was their analysis and interpretation of the caretakers' responses that informed their design and construction of their apps. Without buy in and heightened consequentiality, youth could not work to solve the problem set before them. Without taking up the problem as their own, the task would have remained unengaged.

Figure 1 – Collaborative student notes from sacred site caretaker visits.

What was the valley used for in the past? It was a gathering place and also the location of some of the first settlements on Hawaii Island. King Kamehameha lived in Waipi'o as a child. He was hidden there. **What is the valley used for now?** Farming taro/kalo. Some people live in Waipi'o. Recreation – surfing, swimming, hiking, camping (access to Waimanu). **What are some of the main rules for going down into the valley?** FOUR WHEEL DRIVE ONLY. All wheel drive will not work. Uphill drivers have the right of way. Not reading signs Trespassing **What are some examples of disrespectful things that visitors do?** Trespass on private land--including going to Hi'ilawe falls They do not use the restrooms or port-a-lets to go to the bathroom. Not following requests of caretakers and residents. Even though Waipi'o valley road is a public road, sometimes it is closed to the public. Please be aware of this when making plans to go down.	**What was Pu'ukohola used for in the past?** The heiau was built by King Kamehameha and his men. Its purpose was to unify all of the islands. **What is Pu'ukohola used for now?** It is a place where visitors can come to learn about the history and culture of Hawai'i It is also used by Hawaiian cultural practitioners. **What are some of the main rules for going to Pu'ukohola?** No smoking Stay on the trails Do not take anything Do not litter Stay off the structures **What are some disrespectful things that visitors do?** Litter Go off the trail Take the idea of "sacrifice" lightly. Feel like they are entitled to do things and break rules because they are taxpayers.

This process of youth led inquiry and learning centered their goals and our goal of developing students' sense of rightful presence. We hoped that in creating justice-centered opportunities for consequential learning, students would feel vested in working towards a solution of consequence for the community.

After concluding their interviews, youth worked in teams to analyze the data from their community interviews to compile a class-wide list of expected behaviors for these sites that were agreed on by the class community. Students engaged in several discussions of the geographic and cultural abuse occurring on the island. Like their authoring of a classroom Bill of Rights, the students authored Codes of Conduct that they felt all people should

follow when visiting the *wahi pana*. Youth selected multiple sites to study from across the island. They gathered information about visitor behavior and built apps in App Inventor that shared their codes of conduct, authoring themselves into the roles of teacher and advocate for Hawaiian lands.

Students' sense of consequentiality and rightful presence differed in many ways. Students had varied levels of passion for engaging with the land-based injustices they observed in their communities. Often, those students who were most personally impacted were the most engaged. Students who had multiple generations of family on the island were more deeply passionate about engaging these challenges than youth who recently moved to the island. For example, Malia, a student whose family had been directly impacted by the growing tensions with visitors, was deeply invested in constructing an Advocacy App that could help her family members as they navigated trespassers on their land. She articulated a deep connection to the land and community when she commented, "this is my mountain and my island." She engaged with the codesign and youth-led investigations actively. A leader during class discussions, she was deeply upset to find that App Inventor did not pronounce Hawaiian words correctly; for her this indicated that the technology she was using was "not Hawaiian." She was incredibly frustrated by this because she wanted to use the school piko song as part of her app. Piko is a weekly schoolwide meeting wherein students and faculty chant the *Malana Mai Ka'ū*, a Hawaiian chant that centers on the geography of the island and grounds the students in the space and time of Hawaii. The design team, engaging the core values of student empowerment and centering Hawaiian culture that were central to our rightful presence framework and design process, tabled class plans for the day to allow Malia to lead her peers in an exploration of how App Inventor pronounced Hawaiian words and engaged youth in a process of figuring out how to "hack" the spellings of Hawaiian words in order to get the technology to pronounce things correctly. Through this process, we saw students engage in learning that was consequential to them; as youth drove more and more of the class time, they became more focused and passionate in their work.

At the other end of the spectrum, one child who had only lived on the island for a few years demonstrated a more casual concern for learning about the current problems with tourists. He felt that tourist behavior was problematic but did not articulate his connections to the land and community that other students did. He stated, "I feel like if they [the tourists], um, actually like respect, um, the things like Hawaiian culture and stuff like that, Hawaiian cultural places, then it's not a really big deal." During the youth-led engagement with caretakers, he was also disengaged. Across project opportunities, he took a more casually-disconnected attitude as he did not see himself as tightly connected to the community and land.

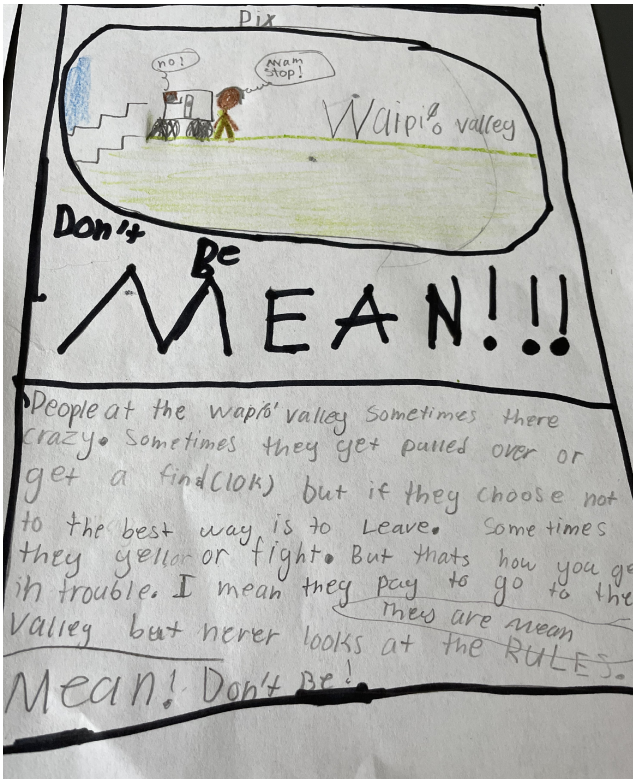
While both students commented that they enjoyed learning from the land caretakers and made meaning through their interviews of the caretakers, Malia articulated the value in learning from the place-based trips themselves when she noted, "I learn better out here, out on our island." Interestingly, even students who were less concerned with the behavior of tourists were engaged in learning about what words they could "hack" for correct pronunciation. The entire class bemoaned the way that most mapping software pronounced Hawaiian words because everyone had common experiences of not knowing what the software was saying. This commonality of experience and centralizing of their daily experience brought greater consequentiality to the project for all students.

One of the ways that we scaffolded for consequentiality and rightful presence was to ensure that the group agreed on the codes of conduct their apps would share. We opted to seek group consensus to ensure a strengthening of the voices of students. Those who felt passionately about tourist disrespect gained space to move their perspective forward in the same way that those who did not feel strongly were. While both perspectives were intentionally given space, apathy was not. By building consensus, youth needed to advocate for the perspective and goals they had, not simply default to passivity. By engaging with their classmates, students who were not initially concerned about the behaviors became more aware of how these actions impacted their classmates' families and the larger community.

Upon class agreement on the codes of conduct for Hawaii's sacred spaces, students engaged in independent design of their apps. The project was scaffolded and structured with guidelines that suggested to youth that they focus on three locations island-wide to share their knowledge of. However, this suggestion was not a requirement for youth. Youth opted to delve into as many sites as they chose. For some students, that meant diving more deeply into one or two sites and creating an app that was very detailed on one spot. Other students opted to engage in designing and developing their apps for as many sites as they had time. This open project flexibility allowed youth to engage with specific sites deeply or several sites more broadly. In allowing for this openness of project design, youth authored their own projects based on their own consequential learning.

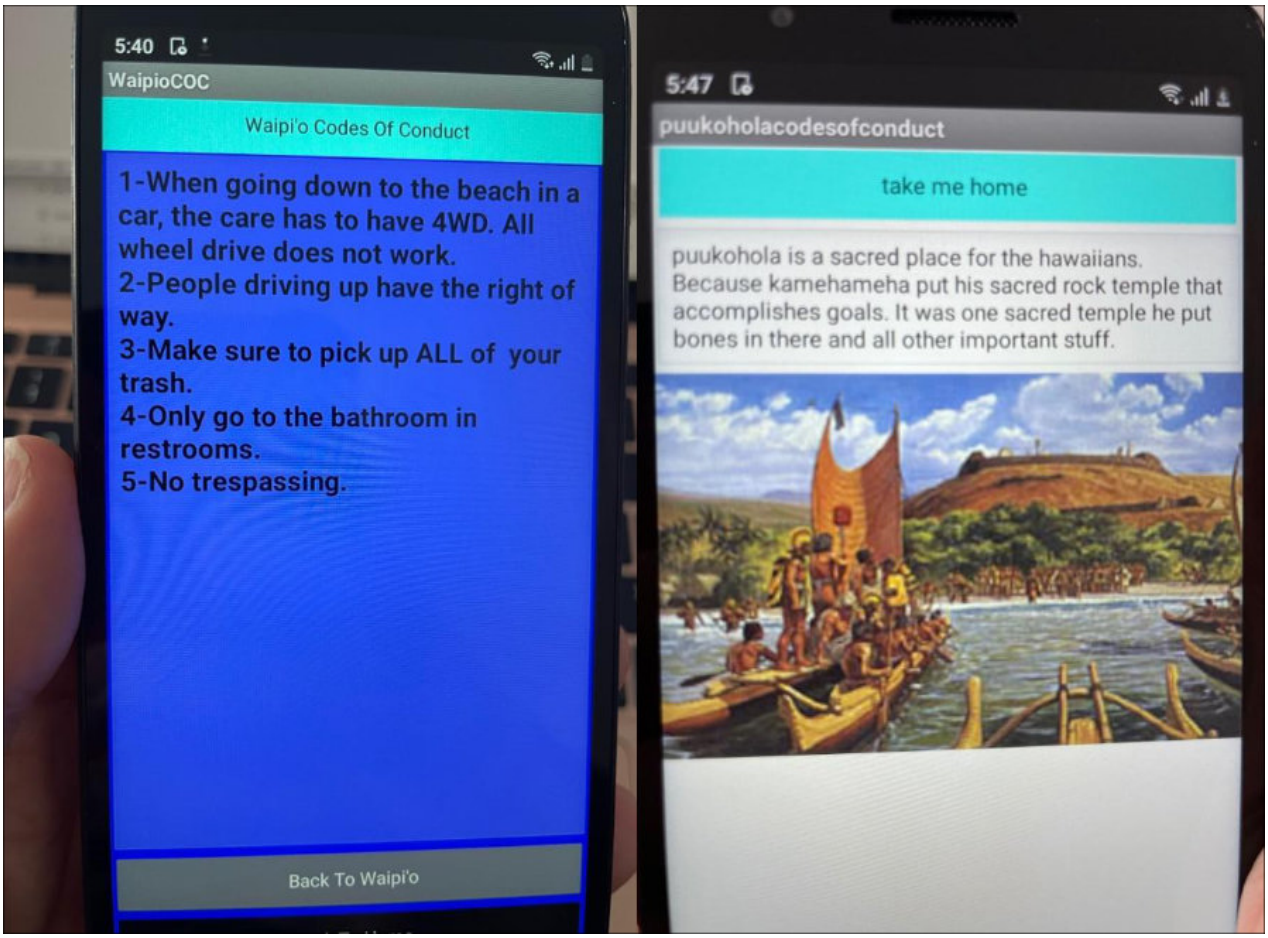
While designing their apps, students were welcomed to engage several scaffolds to support their coding. Importantly, as authors of their own design process, they were welcomed to use scaffolds but not required to do so. First, students engaged with app mapping by using planners to envision what their app pages would look like. Students mapped out the pages of their apps as well as the ways they wanted to engage the information around visitor behavior (see Figure 2).

Figure 2 – Student Advocacy App planner



These scaffolds allowed students to plan out the interrelated pieces and pages of their apps that were challenging to visualize. Within these scaffolds, we see youth making different meanings of the actions and intentions of visitors. The student in the example in Figure 2 centered their understanding around meanness and acts of unkindness to local community members. Ascribing intentional harm or meanness was noteworthy, as this student did not initially see notable harm in the behavior of visitors. It was only after the class discussion on the codes of conduct that he felt differently. Other students conceptualized the behaviors of visitors as a lack of understanding of the expectations. These students opted to provide more information for visitors regarding why the rules were as they were as seen in Figure 3.

Figure 3 – Student code of conduct



As seen in Figure 3, students explain the nature of the terrain and history to the visitors for the purpose of contextualizing the rules. Making their own apps that were intentionally allowed to have an open design and perspective afforded students across the class with greater rightful presence and consequentiality. Youth were able to listen, learn, discuss, and then build apps that reflected their own dynamic understanding and perspective of the challenges and tensions on the island. The variance of perspective evidenced within youth apps while concurrently supportive of community-value-driven behavior expectations indicates youth rightful presence within the project design and execution. Within our design process, we hoped to provide spaces for youth to exist in rightful presence and engage as codesigners across the class, developing their own understandings and interpretations while also engaging their own power and agency. As findings indicate, students stepped into ownership and drove their own projects in ways that fostered their own learning consequentiality and agency within the classroom.

Because we specifically designed for the promotion of youth agency and a classroom focused on youth rightful presence, we wondered how students experienced these things through our summer school class. As noted in the images from Figure 1, students took ownership and authority in authoring their apps. They used forceful language and punctuation to show their passion and feelings about the situation. Their engagement with their Advocacy Apps gave them a sense of agency and made the learning consequential to them. We see this heightened sense of rightful presence and consequentiality in one student's response to a question about what other issues on the island were important to them and how did they think that they could help:

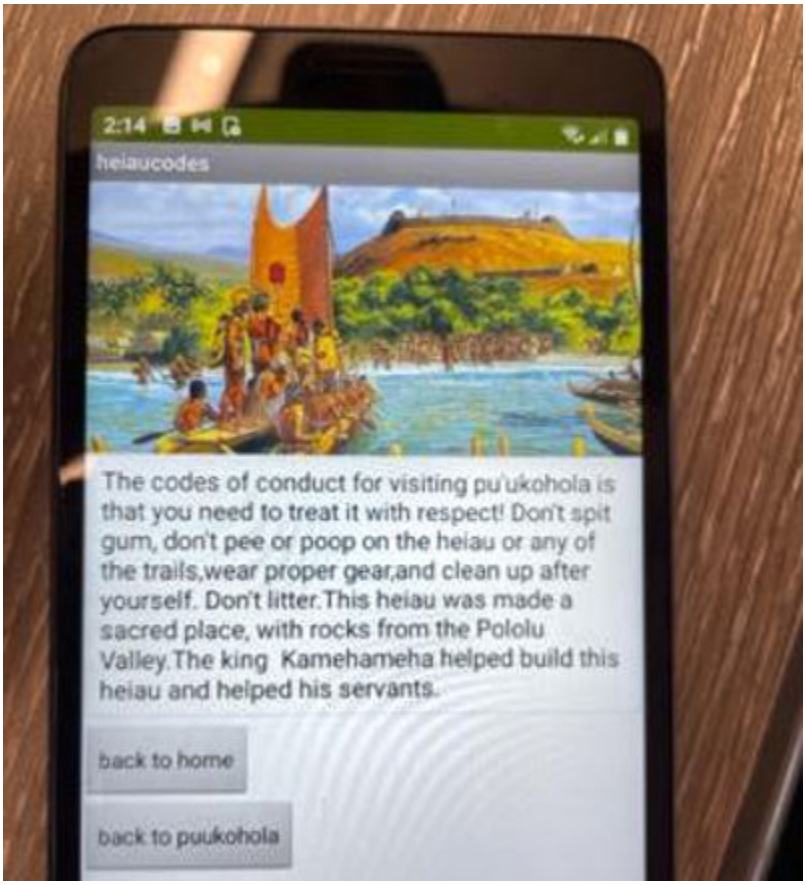
> *So like once a week, maybe twice a week, I go to Hilo. Yep. To help my grandparents because they're getting old. So we clean it up for them and take care of them, some of us stay there, some of us stay here, but every single day when I go by like watching all the homeless people over there feel really bad. And I just see all the dogs, they're homeless and all that. So I just feel really bad. We, I always wanted to give 'em money, but we don't have enough. We don't really bring that much money with us. We don't bring food with us. So yeah. We try to help out people. I try to personally, like, give them my spare food. Like one time I told him to, like, give my spare food, 'cause I can't eat it because it's so big. And um, he, like, just lost his shelters for, we gave him some food. He was really happy, and we gave him some money as well.*
>
> *So if I, like, make a big, big, big app project about helping the homeless, um, I think I could, like, send it out to the homeless people or like the news and everybody could see it. And then people would be like homeless people would be really happy about it. And then they would just like people, more people would start helping the homeless a lot. And a lot of people would agree with me and then they'll make more projects about it. And then when more people that are not helping the homeless can, like, figure out, okay, well, there's a lot of people doing this. I guess I can start doing it. So then almost a lot of people are gonna start helping the homeless. And then soon the homeless people are not gonna exist.*

Here we see a child reckoning with the injustices and challenges of people within his community. From engaging with the Advocacy App project, he believes he could grow a project substantially enough to eradicate homelessness within his community. We see further evidence of students valuing, centering, and experiencing consequential learning in Malika's app in Figure 4.

Malika was asked why she wrote her app so curtly and directly and she replied "Even a kid can read 'don't litter' or 'don't poop!' It is really important that people don't do it." On the last day of class, Malika presented her app to the principal of the school and her entire class. During her presentation, Malika drew praise from administrators and her friends for her clarity and enthusiasm. As she was stepping away from the podium she quipped, "Maybe we can change things." In her follow up interview, the first author sought clarification of her comment. She commented "This was cool. Like, maybe I can help my island and these circuits and computing projects could let me do something. Maybe."

Another friend in the class commented “I feel like, um, if we can actually, like, get it, get people to actually use it, you know, um, learn from it, then I feel like it might actually help.” Students were able to engage in ownership, authorship, and consequential learning to address a problem of justice within their community. In doing so, they engaged geographic and cultural issues specific to their island and communities.

Figure 4 – Malika's App



Conclusions

As Robin Wall Kimmerer (2013, p. 50) said, “The land knows you, even when you are lost.” It whispers the histories, struggles, and the collective knowledge of peoples across time and space to bring meaning and value to the learning and experiences of today. Within the communities of Hawaii, the land and community are intrinsically interwoven, bringing together a social cloth beautifully rich, complex, and married, but marred by colonialism and modern global engagement. Centering the land within Hawaiian educational spaces is a process of centering the Hawaiian and decentering whiteness that supports the rightful presence of Hawaiian youth and creates opportunities for consequential learning across the classroom space. As educational designers, we sought to design opportunities for youth to engage as codesigners, stepping into roles of agency and autonomy that better supported their own rightful presence and consequentiality of learning. In doing so, we engaged in a reflective practice that centered and recentered on goals of youth rightful presence. We developed specific scaffolds for both the technology and students’ sense of rightful presence, making equal the tools and goals of justice-centered learning within the classroom.

For designers of educational experiences and curricula who are looking to engage equity considerations, it is important to ask yourself for who you are designing and what the driving principles of your work are. In our work, we sought to accomplish two specific goals towards designing more equitable learning experiences. Firstly, we sought to center the children and community in which we worked. Doing so involved reflecting on our practices and the power structures of the educational system in which we operated. In doing so, we identified youth rightful presence as a core goal of the work. Secondly, we wanted the learning experiences to hold consequentiality for the youth and provide meaningful, memorable, and engaging learning for the youth. By making the learning we designed more consequential, we believed we could create more opportunities for greater engagement and youth ownership.

Engaging in equity work through a rightful presence framework requires designers to consider the spaces where student voice is marginalized within the normative classroom or learning environment. It requires a reckoning and freeing from the binding structure of power that quiets and controls the voice of young people in exchange for control by educators. Through a recentering on the voices and perspectives of youth, rightfully present design creates spaces for youth developed by youth. It can prove challenging to further instructional and standards-based learning goals when opening the design process to true co-design with youth. However, doing so creates significant affordances that are not possible in other ways or spaces.

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Footnotes

1. The use of the term Indigenous Hawaiian is intentional as the term Native Hawaiian has become colonized by white Hawaiians born on the island who feel that they are native to the island by virtue of their birth there.

2. Citation intentionally not provided to maintain the anonymity of the town and school site.

About the Authors

Dr. Colby Tofel-Grehl is an associate professor in the School of Teacher Education & Leadership at Utah State University. Her scholarship interrogates the structures, systems, and practices that foster inequities across STEM. She designs teacher professional development and curricular materials to facilitate historically minoritized rural youth's success within STEM spaces. Her research has been published in high impact journals such as the *Journal of Research in Science Teaching, Journal of Science and Technology, Theory and Practice in Rural Education, Gifted Child Quarterly,* and the *Journal of Educational Research*. Her funded grants exceed $23,000,000, including a prestigious National Science Foundation CAREER grant. In 2021 NSF's ITEST Program recognized her grant, ESTITCH, as one of three nationally outstanding projects broadening participation in STEM.

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