

Worcester Polytechnic Institute

Envisioning La Conde: Empowering Communities Through Technology and Emergency Plans



**Parceleras
AfroCaribeñas**



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Sponsored by Las Parceleras Afrocaribeñas

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This report represents the work of one or more WPI undergraduate students submitted to the faculty as evidence of completion of a degree requirement. WPI routinely publishes these reports on the web without editorial or peer review.

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For more information on our project resources and files, visit our website: <https://wp.wpi.edu/puertorico/projects/mar-apr-2024/conde/>

Meet the team



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Abstract

The goal of this project was to empower the La Conde community in Carolina, Puerto Rico, by enhancing organizational systems through information technology. Partnering with Las Parceleras Afrocaribeñas, a non-profit organization, we improved their data systems for the La Conde Project, a grassroots initiative that is transforming an abandoned school into a thriving community center. Our collaboration led to the development of four tailored products: a digital inventory system for the community kitchen, a participant management system, emergency escape route maps, and user manuals for system sustainability. These solutions significantly increased La Conde's efficiency, enabling the community to manage resources, track participation, ensure safety, and sustain their initiatives.



Figure A. A group photo of our team, advisors, and key members of the La Conde community.

Executive Summary

Introduction

The women of Parceleras Afrocaribeñas have many different things on their plate from running different programs to handling the paperwork or fixing daily issues around La Conde. The different aspects of our project work to alleviate this constant pressure. We provided multiple online tools that help to reduce the required man hours to manage all of the volunteers, participants, responses, and inventory. In addition to this we have created an emergency response system with the locations of exits as well as emergency resources to inform the community in La Conde how to respond. While we move towards this goal, we also want to establish a strong relationship with La Conde so that we can continue to enhance the organization's continued partnership with the Puerto Rico Project Center.



Figure B. A mural painted outside one of the buildings named “The Energy Oasis” at La Conde. Every figure is of a community member who has positively impacted La Conde.

Mission, Objectives, and Methods

Our project's mission was to empower the La Conde community through technology by creating inventory and participation management systems to increase organizational efficiency and to design emergency plans to enable safety protocols.

We worked with La Conde to achieve the following objectives:

- Enhance La Conde's participant management system to improve efficiency and effectiveness when applying for funding
- Design a digital inventory management system to improve record keeping and organization
- Develop a manual so La Conde staff can learn to effectively use the systems
- Develop emergency escape routes of the property in case of emergencies
- Provide support in their goal of reinstating the Carlos Conde Marín school as a pillar of the community

To achieve these objectives, we engaged in archival studies, interviews, and ethnographies. This approach provided us with valuable insights into the community's unique needs and aspirations. We additionally implemented Google resources (e.g. Google Forms and Google Sheets) to organize the data systems because they are accessible, free, and well-suited for those new to technology. Regular visits to the site allowed us to strengthen our relationships with the community, immerse ourselves in its culture, observe participants, and collaborate with community leaders to develop tailored solutions.

Outcomes and Findings

By the end of the seven weeks, our team provided the La Conde organization with four major deliverables to digitize their overall organizational efficiency, strengthen emergency safety protocols, and alleviate the stress for the leaders.



Figure C: Google Form headers for the cooking and shopping form, donations form, registration form, and comments form.

The figure above highlights the headers for the four Google forms we created for La Conde. The list below details each completed deliverable.

Inventory

- Donations Form - The donations form is used when La Conde receives donations from other organizations or the government during emergency situations. It keeps track of the type of donation; like food, medical, or other, as well as the quantity of each supply.
- Cooking and Shopping Form - The cooking and shopping form is used to add and subtract food quantities from the inventory list. When the user goes shopping or cooks a meal, they will enter the ingredients into the form to be reflected in the inventory sheet.
- Inventory Sheet - The inventory sheet displays the current inventory of all the food in the kitchen, as well as other donated supplies and food. It displays where the food is stored and highlights red when an ingredient is reaching a low quantity, indicating which ingredients need to be bought on the text trip.

Participant Management

- Participant Registration Form - The participant registration form is used to keep track of the community members who participate in an activity at La Conde. They sign in with their name and what activity they are participating in.
- Participant Registration Sheet - The participant registration sheet displays the collected participant data and can be filtered by month, year, and activity in order to accurately show the impact La Conde's workshops are having on the community and how many people participate.
- Participant Comments Form - The participant comments form allows community members to give feedback on different workshops in order for La Conde to improve and encourage growth in their activities
- Participant Comments Sheet - The participant comments sheet organized the form responses to show what percentage of people enjoy different workshops, as well

Hoy es 04/23/2024			
AÑO	MES	PROGRAMMA	4
2024	Abril	Todas	
4/23/2024	John Doe	Zumba	
4/23/2024	Alexander Lee	Zumba	
4/23/2024	Olivia Smith	Zumba	
4/23/2024	Jacob Brown	Zumba	
4/23/2024	Emma Martinez	Zumba	
4/23/2024	William Davis	Zumba	
4/23/2024	Sophia Anderson	Zumba	
4/23/2024	Michael Rodriguez	Zumba	
4/23/2024	Isabella Wilson	Zumba	
4/23/2024	Ethan Taylor	Zumba	
4/23/2024	Mia Thomas	Zumba	
4/23/2024	James Moore	Zumba	
4/22/2024	Ava Garcia	Almuerzo	
4/22/2024	Benjamin Thompson	Almuerzo	
4/22/2024	Harper White	Almuerzo	



During the creative process, we learned some key lessons about completing a project like this Interactive Qualifying Project. Every community has unique challenges, so we tailored our project to accommodate local language and cultural differences.

Findings:

- Digitizing records can assist with efficiency and time management for a community center with a few volunteers who find themselves very busy.
- Creating user friendly forms make the process easier especially when working in multiple languages.
- Having participants fill out the form right when they enter the activity can ease the load on volunteers.
- The Spanish language barrier can be challenging, using helpful notes, pictures and diagrams to help with training can help with the process.
- La Conde is home to an older community that is typically less comfortable with technology.
- Finding the balance between a system that has a lot of features and is simplistic can be a difficult process.

With the majority of the community being elderly, our liaison emphasized that many members had limited technological experience; many are not familiar with digital tools, and some are unable to read or write. This limitation posed a significant barrier in designing the participant management and inventory systems, and we immediately knew it would be beneficial to use a user-friendly digital tool. Specifically, we used Google tools to organize the data systems because they are accessible, free, and ideal for tech beginners to learn. Our IT manual offers a clear, concise tutorial on how to use each deliverable, helping community members become more acquainted with each form and sheet we've created, and increasing their comfort with basic technology.

Our team hopes that our contributions will enable all volunteers at La Conde to be familiarized with Google tools, ensuring the sustainability of our deliverables and giving flexibility for improvement. This will empower anyone to make necessary adjustments to Google Forms, Google Sheets visualizations, floor plans, or emergency routes in the future. By

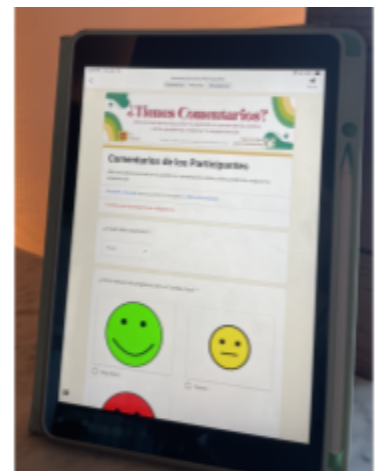


Figure F: The participant form displayed on a tablet for simple use.

educating volunteers in such versatile software, we aimed to boost the community's self-confidence and motivation. Furthermore, we hope that our methods for organizing participant attendance and inventory systems, as well as creating campus floor layouts, can be replicated not only at Carlos Conde Marín School but also in other abandoned schools across Puerto Rico.

Recommendations and Reflections

Our project's mission was to empower the La Conde community through technology by creating inventory and participation management systems to allow for organizational efficiency and to design emergency plans to enable safety protocols. With only seven weeks in Puerto Rico to complete our project, our team acknowledged we had limited time to conduct extensive interviews, analyze the data we observe, and ultimately complete our final deliverables by the end of April. To help with the sustainability of these deliverables, we recommend the following actions the organization should take.

- Have participants fill out digital forms as they enter workshops
- Hold tech workshops to build confidence and familiarity among community
- Ensure emergency routes are constantly up to date

Currently only the project leaders are familiar with how the participants' attendance form operates. To enhance efficiency, it would be beneficial for them to implement a routine whereby participants fill out the form as soon as they arrive at a specific workshop. Community activities are currently held in three buildings, and we anticipate that renovations will extend to the rest of the buildings. Consequently, the floor layouts will change over time. For the safety of the community, it is crucial to ensure all emergency routes are up to date.

Looking ahead to future collaborations with WPI PRPC and La Conde, it is important to consider additional ways to assist this organization. Our liaison has highlighted the challenges of organizing campus cleaning days, which require long hours and limited resources. Planning a large-scale cleaning event, promoted with brochures distributed to local communities and other nonprofits, could improve networking and attract more donations. Given the community's limited tech exposure, our digital-focused deliverables could greatly benefit from complementing them

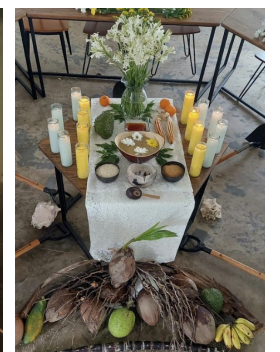
with small technology workshops. These workshops would introduce community members to this digital world, build their confidence, and encourage further learning. We incorporated simple forms for participants to sign in with, utilizing emoticons and simple questions to provide the inexperienced community with simply incorporated technology to foster a familiarity with technology.



Figure G. Members of the community representing La Conde after attending a Community Assembly discussing a work plan for future projects.

We are extremely fortunate to collaborate with such a welcoming community. This partnership offered a significant learning experience for our team, one that will be unforgettable. Working with the nonprofit Parceleras AfroCaribeñas was particularly rewarding; each visit to the site reinforced the positive impact of our efforts, alleviating some of the burdens faced by community leaders. Moreover, supporting a community that has experienced repeated marginalization instilled a deep sense of importance and pride in our work.

Ultimately, we hope that our methods for using simple technology to increase organizational efficiency, as well as strengthening emergency safety protocols, can be replicated not only at Carlos Conde Marín School but also in other abandoned schools across Puerto Rico.



1.0 Reviving Puerto Rico's Abandoned Schools: The La Conde Project

Since 2007, more than 650 public schools across Puerto Rico have been abandoned. These once vibrant hubs, fostering community and education, now stand empty, serving as constant reminders to nearby neighborhoods of the uncertainty surrounding Puerto Rico's future. With over half the population living below the poverty line, ongoing gentrification worsens the issue by displacing families, all while the island succumbs to unforgiving natural disasters. Consequently, local children are deprived of educational opportunities, families face the challenge of relocating to areas with accessible public schools, and elderly individuals are left without viable relocation options. With no resources or aid provided following school closures, many people felt betrayed by the government, prompting protests and demands for reopening, yet their pleas went unanswered.



Figure 1.1: Students, faculty, and families protesting the closure of La Escuela de Carlos Conde Marín in May of 2017 (Las Parceleras Afrocaribeñas).



Figure 1.2: A classroom in La Escuela de Carlos Conde Marín after hurricane Maria.

Community leaders refused for this injustice to define their once flourishing communities and began grass-root initiatives repurposing abandoned schools into community centers. One example is the Carlos Conde Marín School that was once an elementary school in San Antón, Carolina. The abrupt closure of this school sent shockwaves throughout the community. The situation worsened when the government repurposed the three-acre school farmland into a landfill, stripping the locals of clean air and damaging a once thriving ecosystem. In response, the community banded together to advocate for themselves, their families, and their neighbors. During their efforts, they allied under the nonprofit organization, Parceleras Afrocaribeñas, a black women-run organization dedicated to encouraging community-driven projects within marginalized communities. The La Conde Project was founded only months after the schools closing in 2018 with the goal of “turn[ing] it into a community space that encourages, promotes, and values neighborhood creativity as a trigger for opportunities” (Parceleras Afrocaribeñas, 2020).

La Conde now has a functional multi-use kitchen that serves the community members alongside a variety of other programs to bring joy to their neighborhood. Alongside this, a number of programs uplift the community, including Zumba classes, art workshops, back-to-school events, and culturally enriching art shows. Through dance and theater, the

organization celebrates its rich heritage, fostering a sense of unity and pride. There are over a hundred more events that have been organized within the last six years of La Conde coming to life, and the Parceleras Afrocaribeñas always show gratitude to everyone who has contributed to their mission.



Figure 1.3: The community coming together at La Conde's circus event to celebrate children going back to school.

We have partnered with the visionaries of the La Conde Project to help digitize their management systems and emergency mapping of the 24 square-kilometer campus. They have been keeping records of their inventory, and participants via pen and paper, which has led to missing data, hundreds of long hours manually inputting data, and many headaches. This has made the process of applying for funding overwhelming and set them back a year, almost two. Our goal was to alleviate these issues by building a participant management system, inventory management system, mapping emergency escape routes, and connecting with the people of the La Conde project through volunteer initiatives. Through these goals, we aim to successfully build a relationship with Parceleras Afrocaribeñas and the surrounding community by achieving the following objectives:

- Enhance La Condes participant management system to improve efficiency and effectiveness when applying for funding
- Design a digital inventory management system to improve record keeping and organization
- Develop a training manual to teach the visionaries how to effectively use the systems
- Develop emergency escape routes of the property in case of emergencies
- Provide support in their goal of reinstating the Carlos Conde Marín school as a pillar of the community

Our project's mission was to empower the La Conde community through technology by creating inventory and participation management systems to allow for organizational efficiency and to design emergency plans to enable safety protocols.

2.0 Setting the Scene

This chapter provides an overview of the history of Puerto Rico and the key factors that ultimately led to the closures of schools across the island and its academic educational crisis. The section also delves into the history of racism in Puerto Rico, and where it is most prevalent in communities today. We then touch on information technology and volunteer management, explaining the benefits of common tools used. Finally, we introduce our project's liaisons and share their stories of how their passion for La Conde came to be.

2.1 School Closures in Puerto Rico

Puerto Rico's high level of educational impoverishment has provoked an academic crisis, which many communities are still bouncing back from. For years, the nation's education system has been hindered by multiple factors. Before understanding the ultimate impact these obstacles had on the island and the impact it still has, it is important to take into account the big picture challenges that caused an increase in school closures.

Puerto Rican migration to the mainland is driven by the search for better socioeconomic outcomes for families. As rich, mainland Americans move into the island, the local communities are often displaced. With median household incomes at \$24,000 and nearly half of the island's population living in poverty, outward migration may seem beneficial for these local families seeking better opportunities, despite the ongoing gentrification (U.S. Census Bureau, n.d.). Especially after its economic crisis however, the island's population has seen a drastic decline, resulting in a 27.2% decrease in the total number of Puerto Rican children between 2006 and 2015 (Mayol-García, 2020).

The population decline exacerbated government deficits as there were fewer people to pay local taxes. As the decline in the island's population persisted, its debt crisis escalated, forcing the local government to adopt austerity measures that reduced government spending on public services. To diminish the education and health care services, they ultimately decided to close schools, particularly ones with smaller student populations. This initiative began with their second round of closures of 184 public schools, affecting 27,000 students and 2,700 teachers

(Etehad, 2017).

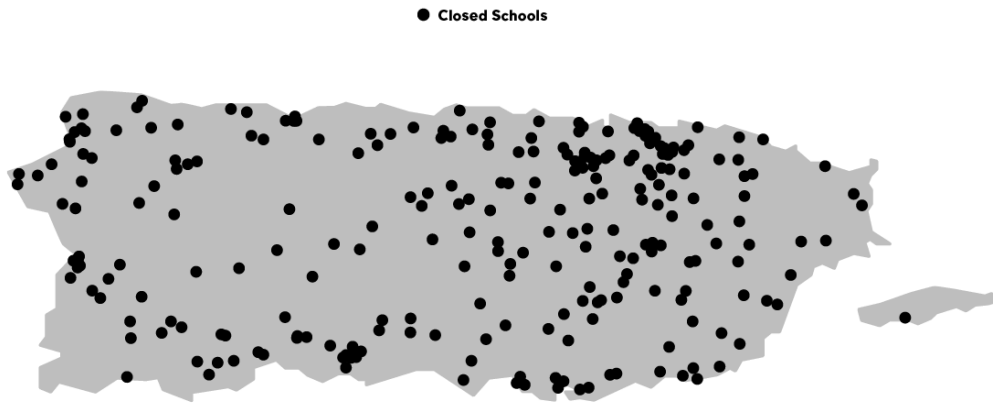


Figure 2.1: Public school closures in Puerto Rico since September of 2017 (The Disappearing Schools of Puerto Rico 2019).

As if it could not get any worse, Puerto Rico's great vulnerability to natural disasters, particularly hurricanes, poses a significant threat to the stability of its educational infrastructure. In 2017, Hurricane Maria with 155 mph winds touched down on the island, causing massive damage for all 3.4 million inhabitants (Mercy Corps., 2018). This unprecedented amount of damage combined with the slow coordination of aid from inside and outside the country caused great shockwaves across the country. The category 4 storm devastated the island, "uprooting trees, downing weather stations and cell towers, and ripping wooden and tin roofs off homes" (Mercy Corps., 2018). Public schools especially took an incredible hit, while the hurricane also disrupted utilities and displaced thousands of communities. The aftermath of these disasters resulted in an ongoing decline in student enrollment, already driven by family migration patterns. More specifically, the island's population has dropped 2% in just the last two years (US Census Bureau, 2023).

Hurricane Maria ruined the already impoverished Puerto Rico. These disasters led to the deaths of roughly 3,000 people, while thousands had no choice but to emigrate after the loss of critical infrastructure, ultimately giving yet another reason for the further school closures (Mayol-García, 2020). Especially in the economically disadvantaged areas, the shortage of enrollments made it financially unsustainable for the schools to be kept open.

Carlos Conde Marín School was one of the many schools that were jeopardized and ultimately abandoned. After the storm of Maria, the number of enrollments dropped from 750 students to just 400 students. The instability of the educational department compelled families to transfer their kids to other schools with more durability and dependability. Students would walk for many hours to schools in Carolinas and San Juan; other families would migrate to the mainland to Florida or even New York. Those who decided to switch schools within the island had the option of taking a trolley that would run hourly from 6 am to 5 pm daily. However, the trolleys were unforgiving towards the students; they continued driving even when a student was just a few feet away, forcing them to undertake the lengthy walk to school.

With the school closure, there was a new opportunity for the community to organize and mobilize. With many passionate leaders in the community, a strike was called which was principally led by several strong independent women from the community. Despite multiple protests from the desperate community, Carlos Conde Marín School was forced to shut down without announcement in 2017. On that sudden Friday, the education department showed up at the school, prohibiting teachers and students from entering the building. Incredibly, the department did not provide any further resources, leaving the community helpless and in shock. The poor governance and the environmental catastrophe of the island led to further abandoned schools, eliminating significant assets of Puerto Rican communities.

Beyond their primary role as educational platforms, public schools across Puerto Rico serve as foundational pillars within communities, providing vital services such as nutritional support, shelter during extreme weather, voting centers, and spaces for community interaction. School closures have resulted in the loss of these critical community spaces. The loss of schools in lower-income areas not only deprives teachers of stable employment but also encourages the departure of educated individuals from these communities. With a significant volume of family migration, the



Figure 2.2: The abandoned quad of Escuela Carlos Conde Marín that once held 700 students.

education system privatization, and Puerto Rico's \$74 billion debt, many schools were forced to shut down. While these closures yield minimal financial savings and revenue for Puerto Rico, they incur cascading costs that jeopardize the well-being of students, the vitality of neighborhoods, and the democratic participation of families. Students from marginalized backgrounds, including those from low-income families and rural communities, face great challenges as they lose access to educational resources and support systems. Ultimately, the students are forced to travel further to access education. To make matters worse, a wave of earthquakes devastated the southern region of Puerto Rico in 2020, further decreasing the possibility for schools to reopen.

Moreover, the closure of schools diminishes opportunities for social engagement for students. Schools serve as central points for community gatherings, fostering a sense of belonging among locals. Not only do these communities lose classrooms and cafeterias, but they also lose sports grounds and recreational centers, including theaters, libraries, and voting stations, which are important venues for social interaction. Additionally, the closure affects various aspects of daily life for the students' families. Many parents rely on schools for their children's education, of course, but also for childcare services, allowing them to work and pursue other activities outside the home. Furthermore, the closure of schools disrupts these arrangements, placing additional strains on Puerto Rican families and exacerbating existing burdens on finances and resources.

With over 650 closed school buildings in Puerto Rico, a notable initiative for repurposing school buildings has surfaced to preserve a critical community asset (Davis, et al., 2023). Communities are presently engaged in these processes aimed at determining optimal strategies for these vacant schools, though no comprehensive study has been conducted to provide appropriate guidance on the most effective avenues for repurposing schools. Since 2007, 44% of public schools have been abandoned; the longer these schools are shut down and a plan is not developed, the more difficult the reuse and redevelopment process becomes (Yedidia et al. 2020). Adaptive reuse involves repurposing existing buildings for purposes other than their original design, aiming to preserve social, cultural, and historical values held by community residents. This process fosters a sense of connection to the community's identity. Moreover, adaptive reuse projects contribute to the psychological and sociological well-being of Puerto Ricans by providing a symbol of stability in the face of upheaval.

Puerto Ricans have proven their resilience in the face of adversity time and time again, where communities come together, working tirelessly to reclaim their social institutions through grassroots initiatives (Connors, 2012). A compelling example of adaptive reuse can be observed in the transformation of San Salvador's Escuela Segunda Unidad Mercedes Palma into a community school, relieving an aspect of the street they lost (Singh, et al., 2019). This approach not only reuses the physical space of the former school but also preserves its legacy while addressing the evolving needs of the surrounding community. Another initiative was carried out by a WPI project team in 2023. They collaborated with La Goyco, a nonprofit organization, that transformed the former Pedro G. Goyco school to become a center that provides cultural, health, and environmental services to the Machuchal community. They assisted organizations that planned to repurpose abandoned closed schools into community centers by creating general guides to offer advice to begin the process and expanding the network between community initiatives.

Understanding these schools as essential public assets that anchor community-driven development is important to shift the changing priorities of Puerto Rico's education department. By recognizing the significant role and potential of schools to act as drivers for community empowerment, members of the local community can work together to formulate plans for the adaptive reuse of schools throughout Puerto Rico.



Figure 2.3: Above shows 161 abandoned schools that have been repurposed in Puerto Rico. The colors signify ownership entities as follows: Red for Municipality, Blue for Private Education, Green for Rescued School, Purple for Business, Orange for Church, and Yellow for Other. (Davis et al., 2023)

2.2 Racism in Puerto Rico

Systemic racism is said to occur when racially unequal opportunities and outcomes are inbuilt or intrinsic to the operation of a society's structures (Benaji, 2021). Puerto Rico is a Commonwealth of the U.S., granting them limited benefits compared to the states. While Puerto Ricans are U.S. citizens, they are disenfranchised when it comes to voting representation in Congress and the presidential elections. This lack of full political autonomy contributes to marginalization and exclusion from the decision-making processes that directly impact Puerto Ricans' lives.

Economic disparities, limited access to quality education and healthcare, and discriminatory practices in housing and employment perpetuate racial divides. The median income in Puerto Rico is \$24,112, while on the mainland it is nearly triple with the household median income being \$74,755 (Bureau, 2022). Infrastructure has not been properly maintained since the early 2000s after major budget cuts were made to maintenance departments of the island. Puerto Rico having the longest blackout in U.S history of 328 days, affecting 1.5 million people, is a direct result of these budget cuts, in addition to the lack of upkeep the government has been providing Puerto Rico since becoming a commonwealth of the U.S. (Zahn, 2022).

For many years, Puerto Ricans have been coming to the States to escape the economic challenges faced on the island. Over the last 10 years, nearly 500,000 Puerto Ricans have left in pursuit of a higher quality of life (Bureau, n.d). This outflowing migration has led to many rich, white non-native investors buying island properties, further increasing the cost of living while displacing more Puerto Ricans (Graulau, 2021). As of 2022, white non-natives consist of 0.6% of the island's population, yet have an average income of \$45,762, which is more than double the average income of Puerto Ricans average income lying at \$16,473 (Bureau, 2022). Locals have voiced their anger on this issue, claiming “They’re buying our land, They’re buying our houses. They need to leave. Period” while others have been grieving the loss of their homes; “They’re pushing us out of our place... we will be Puerto Rico without Puerto Ricans” (Graulau, 2021). These systemic inequities underscore the urgent need for comprehensive reforms to address the root causes of racial injustice and ensure equitable opportunities for all Puerto Ricans within the broader American framework.

While the island's diverse population encompasses a blend of African, Indigenous, European, and Caribbean heritage, systemic inequalities continue to marginalize communities of

color. Afro-Boricuas and those of mixed-race backgrounds often face heightened discrimination and are disproportionately affected by poverty and violence. Systematic racism within Puerto Rico is evident in the disproportionately low mean income of Afro-Boricuas in 2022, which stands at \$15,112 (Bureau, 2022). Moreover, colorism remains prevalent, with Eurocentric beauty standards perpetuating prejudice against darker-skinned individuals. There is a quiet erasure of blackness within Boricua history, where society emphasizes the pride of having Latino or indigenous descent, but not as much pride is shown for African heritage. These injustices resulted in only 9.84% of people on the island identifying themselves as Black, while 50.3% of people identified themselves as White (Data USA, n.d.). A group of Black Latina Scholars known as the The Black Latinas Know Collective have brought attention to this matter, stating “We are directly affected by anti-Blackness narratives and practices, even those that manifest within the process of scholarly production. Perspectives that exclude our Black Latina thought are by definition incomplete” (Figueroa, 2020). Afro-Boricuas have lost the “liberty to be [themselves]” and that abuse towards black people has become more psychological rather than physical (The Griot, 2020).

A lot of people in Puerto Rico deny there's racism. They say that we are a mix of three races, and we don't want to acknowledge the problems of racism. My experience as a Black Woman, getting into a room is a problem. When I go to the pharmacy, I am always watched by the security guard. When driving while black, suddenly, you're a suspect.

Sacha, (Afro-Latinx Revolution Documentary, 2021)

The lack of representation of Afro Boricuas is deeply rooted within the politics of Puerto Rico. Puerto Rico has elected a total of twelve governors into office since 1949, all of which have been white, demonstrating a long history of exclusion that continues to damage black communities. In 1993, Governor Pedro Roselló, created the Iron Fist Against Crime Bill in order to gain control over the high violence rates, but this strict enforcement was deemed to be more racist and classist and was quickly put to an end (The Griot, 2020). His son, Ricardo Roselló, was elected as governor in 2017 but was soon thrown out of office by popular street protests in 2019 due to the shocking nature of leaked private messages. These messages included sexist, homophobic, racist, and insensitive comments about Puerto Rico's people and the victims of

Hurricane Maria. Minority groups in Puerto Rico reached a tipping point and took to the streets to demand accountability from corrupt leaders and reclaim power for the people. “To make noise we used La Plena, to resist with our bodies and voices, we used la Bomba, [and] we danced reggaeton in front of the Cathedral” (The Grio, 2020). The union of oppressed communities coming together and successfully rebelling against the corrupt government revealed the true strength of community solidarity and mobilization.

2.3 Creating a Volunteer Management System

Non-Profit Organizations (NPOs) are groups of people who focus on providing public services or public goods for the betterment of society rather than profit. Grants, donations, and fundraisers are a few ways NPOs generate income, which goes directly toward the initiative they are supporting. Volunteers are crucial actors within NPOs as their willingness to dedicate unpaid time and work allows their organization to maximize their contributions to the community (Connors, 2012). Organizations are consistently increasing the size of their volunteer base, for both the enrichment of their programs and the fulfillment of their members. The nonprofit sector of Puerto Rico has grown exponentially while access to public education decreased. There are 2,381 non-profit organizations in Puerto Rico which, combined, employ 41,755 people, earn more than \$4 billion in revenue each year, and have assets of \$12 billion (Cause IQ, 2024). Nonprofits work to benefit the community they are in, while also employing and empowering thousands of people across Puerto Rico.

With all of the volunteers that nonprofits employ, a volunteer management system can become critical to organizing employees and volunteers. A volunteer management system compiles volunteer information and makes it accessible for administrators. In past years, WPI projects implemented volunteer management systems in La Goyco and Caño Martín Peña (Chesaneck et al., 2023), (Jayne et al., 2021). La Goyco is a much larger organization than Parceleras AfroCaribeñas in terms of number of volunteers, budget, and access to resources. However, we can still use this past project in addition to (Chesaneck et al., 2023) findings as a template for our project. These systems make finding and accessing volunteer data simple while creating a visually appealing and well-organized platform. The Goyco and Peña groups used a JavaScript library tool called Retool to allow volunteers to check in and select which project they were working for, as well as create a log for administrators to keep track of volunteer progress

and engagement. They logged how often volunteers helped when they volunteered, how long they volunteered, and what tasks they worked on. This type of information is invaluable, and can help the organizations apply to grants for future expansion because it gives donors a better sense of the total number of participants and activity hours (Kerekon, 2024).

Retool is a web development software that builds custom business software “10x faster than coding from scratch” (Retool, 2023). Web development software allows administrators to create data analysis visualizations which are simple to create and easy to view. A software model like this emphasizes on their website that it is “no-code”, meaning the software does data analysis automatically, and the administrator simply needs to display the data. We do not want the software to be complicated, which is why we are using Google Suite and a no-code web development tool. By creating a training manual, an administrator with very little coding experience can successfully view and manage volunteer data. We found three no-code web development softwares; Retool, Odoo Studio, and Bubble. All three of them can build customizable apps to display information. All three have a free trial period, but when it comes to releasing the app for use, Retool was the cheapest at \$10/user/month, while Odoo and Bubble were \$24 and \$29/user/month, respectively. Additionally, Retool can be directly linked to Google Suite, allowing for seamless transition between volunteer input and app data visualization. One major benefit to the Retool software is that it continuously tracks and organizes all the data that is collected from Google Suite so no additional work has to be done by admins. This helps ease the burden of manually tracking people’s hours and eliminates manual analytics. In this style of volunteer management system, the volunteer puts the required information into a Google Form or similar data entry system. The information is automatically sent to a Google Sheet where an administrator can go through and check a box to validate the responses. The validated responses are sent directly to Retool to be analyzed and displayed (Kerekon, 2024).

One thing we must be aware of is if an administrator accidentally or unknowingly moves where or how the information is stored in the spreadsheet, Retool will be unable to pull the information from the correct cell. If there are administrators who do not have an in-depth understanding of the system, it could cause problems and significant data loss.. La Conde indicated to us that they only have one or two people who are trained in information technology, so if there is an issue with the data transfer, there are very few people who would be able to help. To avoid these outcomes, we will train the members of La Conde to use the volunteer system so

that they can effectively diagnose and solve any problems—while avoiding some of the common errors that could arise.

Volunteer managers often prioritize general volunteer management skills over experience with digital tools, like Retool and Excel, highlighting the importance of selecting an affordable and technologically accessible volunteer management system for organizations like La Goyco (Kappelides & Johnson, 2020). Despite the number of volunteers in the U.S. and other countries, many nonprofit organizations struggle with managing volunteers. For example, volunteers have the freedom to choose when, where, and how they volunteer, which can lead to challenges in their commitment to the organization. To ensure successful volunteer programs, organizations need to attract, engage, and retain volunteers, which requires understanding volunteer behavior and effective volunteer management systems (Kappelides & Johnson, 2020). As organizations like Parceleras Afrocaribeñas grow, they can adapt and implement management systems that make volunteer management sustainable and easier to organize.

2.4 Information Technology (IT) Training

IT training is a crucial tool for organizations to use. Without IT training, an organization can struggle to use time-saving tools when people do not know how to use them. We will be using the Google Suite to create our inventory management system, specifically forms, sheets. This software is free for the community to use as well as it being a user friendly option for those who may not have prior experience. We ended up deciding on the Google Suite because of the affordability and access advantages over excel and other management softwares. Luckily free training from Google for these applications exists.

The Google Sheets training is a comprehensive video/interactive experience that leaves the user with a certification to display as well in their Google account. The user will gain proficiency in accessing Google Sheets, initiating both blank spreadsheets and templates. They will be equipped to manipulate data by adding, importing, sorting, filtering, and formatting within Google Sheets, and learn to seamlessly work with various file formats. By mastering formulas and functions, they'll expedite calculations and optimize data utilization. Upon course completion, they will be eligible to earn a badge to help advance their career prospects (Google Cloud Skills Boost, 2023).

Additionally, the training for the sheet form utilizes multimedia methods, but this particular training is created to take as little time as possible (10 minutes). This training covers many sheet capabilities including “manag[ing] event registrations, creat[ing] a quick opinion poll, creat[ing] quizzes ... or surveys right in [their] mobile or web browser—no special software required. ... [the user] can [instantly] summarize results at a glance with charts and graphs.” (Google Workspace Learning Center, 2023). These google learning modules also have the capabilities to change languages which would be incredibly helpful to community members who would find a spanish version more accessible.

In addition to these, there are other options from a site that are oftentimes more complete and in depth training courses. However, oftentimes these sites cost anywhere from 15-100 dollars depending on the length of the course and amount of educational content that it provides. Completing and supplying this training to the La Conde group is crucial for them to be able to successfully use these tools for years to come.

2.5 Leaders of La Conde

Our partner is Parceleras Afrocaribeñas who “ha[s] come together to carry out social justice projects in San Antón, Carolina... [for] the transformation for equity and social justice of our black communities” (Parceleras Afrocaribeñas, 2020). To complete these projects Parceleras Afrocaribeñas followed a strong mission statement “Our projects derive from a drafted plan with community consensus. This plan contains the goals and objectives that we have proposed together as a community. Our mission is to launch cultural, artistic, and ecological projects of social justice and anti-racism. We advocate for the protection of natural resources in the face of exploitation that communities like ours live through.” The La Conde Project itself is unique in many ways and aims to serve a large population in and around Carolina.

La Conde is a community initiative focused on transforming public spaces through an anti-racist, decolonizing, and entrepreneurial approach. It encompasses elements of ecology, emancipatory education, arts, and health, catering to individuals across different age groups including children, adolescents, and focusing on older adults residing in areas such as San Antón, Saint-Just, and Los Mirtos. The project's primary objective is the revitalization of the former Carlos Conde Marín School, which closed in 2017, into a community hub that fosters local creativity, and creating new opportunities. - Parceleras Afrocaribeñas, 2020

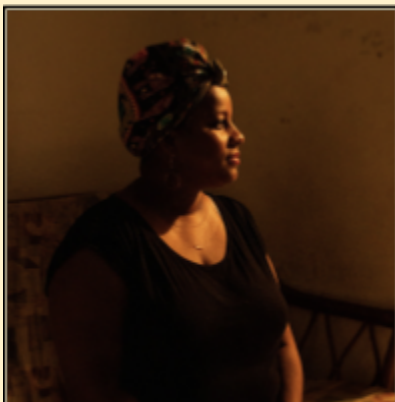


Figure 2.4: The photos above show the transformation of La Conde right after the hurricane in 2017 (top) to the renovated and revitalized building today (bottom).

The project center consists of 11 total separate buildings on the campus; three buildings have been entirely renovated for community use while the other eight are still underway. It was founded by six Afro-Caribbean women and supported by many other teachers and mothers in the community who have always known the Carlos Conde Marín School to be the heart of their community. These women have made it their ultimate goal to ensure that this space can remain standing as a pillar of the community. The three renovated buildings are the kitchen, activities room, and the medical building. The major demographic served by this community encompasses a racially diverse population of elderly residents in San Antón, Carolina, and the surrounding areas. The kitchen is used on Mondays, Wednesdays, and Fridays to cook and feed members of the nearby community from 11:30 AM - 1 PM. These are the only meals that some of these community members know they will eat that week. Glenny pointed out an elderly couple who came to lunch one day, describing it is uncertain what they may be eating on days that La Conde does not serve food. We also noticed that some would travel by car, whereas others would bike

or even walk to the center. These community members pack leftovers to bring home and hold them over between meals. It is also apparent that the community is incredibly close with one another. In some cases, people who come to every meal have a plate set for them before they even walk in. Connected to the kitchen is the activities room. This room is used for Zumba on Monday, Tuesday, and Wednesday from 9 - 10 AM, as well as a pottery class on Wednesday from 1 PM - 3 PM. All of these community events are managed through a WhatsApp group chat containing the regular members. Everytime we visited the community center, we would see new faces engaging with the activities provided or joining their lunch distributions. These new participants tend to hear about the workshops and lunches from regulars within the community or through Parceleras Afrocaribeñas' instagram.

Founders and Key Collaborators of La Conde



Glenny Alvarez
Co-Founder and
Project Director



Dolly Santiago
Co-Founder and
Community
Outreach



Dolly Denisse
Collaborator

Glenny Alvarez, a co-founder of Parceleras Afrocaribeñas and the Conde project director, is our main liaison for the La Conde project. Glenny used to work as a nurse at a local hospital in Puerto Rico. This was the same time that her daughter was attending school at La Conde. Glenny worked long hours at the hospital, and was not around to take care of her daughter as much as she would have liked. One day, she went to pick her daughter up from school and the teacher did not recognize her. This was a major turning point in Glenny's life.

Glenny's mother was always around to take care of her and provide the support she needed, and Glenny felt like she was not giving that same care to her daughter. She quit her job at the hospital to raise her only child. Glenny expressed to us that it was difficult to give up her household's second income, but she cared about her family too much to prioritize her job. This perfectly exemplifies who Glenny is. She takes care of her family no matter how heavy the burden it may place on herself. Glenny told us that her family extends beyond her blood. The community is her family. The adults, teachers, and students at La Conde were her family, so when the school shut down in 2017, she knew she needed to take care of them. She attended protests of the school's closure, and fought to gain access to the property. If the government was going to shut down her community's school, she was going to turn it into a community sanctuary. Today, in efforts to rebuild the community, she takes on multiple responsibilities within Parceleras Afrocaribeñas, including running the administrative tasks, meeting with outside members and volunteers, and scheduling appointments with inspectors, government officials, and community activists. In addition to running day to day operations at La Conde, she is pursuing her Masters degree in Secondary Education at Dewey University, a local college.

Dolly Santiago is another co-founder of Parceleras Afrocaribeñas and helps with community outreach. Dolly's family and her have deep connections with the school, and like other parents, she was devastated once the school had to shut down. When the opportunity came to strike the Puerto Rican education department, she was the first there and led the powerful walk. Today, as one of the leaders of Parceleras Afrocaribeñas, she not only helps with the tracking of community members participating in the activities provided, but she also has the ability to reconnect with a longtime passion of hers. "Music makes me want to move!" she would say in Spanish. On Mondays, Dolly teaches a one hour zumba class. Our team had the opportunity to take two of her zumba classes, with roughly 15 other dance enthusiasts or other community members who wanted to get active.

Dolly Denisse is a key collaborator among the La Conde project. She cooks meals for 50 community members Monday, Wednesday, and Fridays regularly, while also managing the center's inventory system by ordering ingredients and accounting the quantities of each ingredient.

3.0 Methodology

The goal of our project was to work with Las Parceleras Afrocaribeñas to enhance their inventory and participant management system, helping them coordinate and optimize future volunteer initiatives for the La Conde project. Throughout our seven weeks on the ground, we visited the site every Monday, Tuesday, and Wednesday, giving us about 21 working days at La Conde. The team utilized various approaches to not only achieve our project objectives but to also further expand our understanding of the community's passion for rebuilding their school and encouraging volunteering among local Puerto Ricans. We triangulated our research methods to establish multiple perspectives and sources. By using archival research, interviews, and ethnographies, we ensured that we approached this project from every angle.

The objectives we achieved by the end of our seven weeks are the following:

- Design a participant management system tailored to La Conde's specific needs
- Design an evaluation system to allow community feedback on workshops
- Design an inventory management system to keep track of La Conde's food inventory
- Develop a training manual to teach volunteers how to effectively use the digital systems
- Develop a digital mapping system of the property and create emergency evacuation routes and general floor plans
- Provide support in their goal of reinstating the Carlos Conde Marín school as a pillar of the community

3.1 Archival Research

Our team utilized archival research as the primary method to understand the importance of implementing an inventory and participant management system for the La Conde Project. This work benefited the communities of San Antón, Saint Just, and Los Mirtos. Before arriving in Puerto Rico, this qualitative research method empowered our team to analyze credible resources related to our projects' objectives. Executing precise and thorough analysis allowed us to maximize the effectiveness of our research efforts when working alongside Las Parceleras Afrocaribeñas.

We determined the credibility of a source through various tactics. First, we used trustworthy databases such as Google Scholar and WPI Gordon Library. These were digital libraries consisting of thousands of publications including journals, articles, research papers, and textbooks. Second, our team focused on finding peer-reviewed sources, which had been analyzed

and approved by experts in their field before publication to ensure higher academic quality. Third, to confirm the credibility of a non-peer-reviewed source, we investigated the reputation of both the author and publisher through their qualifications, previous publications, and references. Ultimately, we triangulated all our sources to find areas where scholars broadly agreed or disagreed.

Previous projects completed through WPI project centers, such as La Goyco and Caño Martín Peña (Chesaneck et al., 2023; Jayne et al., 2021), were extremely valuable in understanding what inventory and participant management systems we could implement. Our team reviewed and analyzed these past projects to understand their methods, observations, and results. We used this foundation of information to customize our inventory and participant management systems and digitized maps for La Conde.

3.2 Semi-Structured Interview

A research method commonly used to establish a stronger depth of understanding of a topic is the Semi Structured Interview. We targeted experts and knowledgeable subjects, community members, our project liaisons, previous IQP students who have worked on similar projects, and scholars whose research we have used. During the interview process, it is up to the interviewer to create an environment in which the interviewee will provide as much pertinent information as possible. During the process, the interviewer must act as an actor, director, and choreographer to control and navigate the conversation onto topics we need to cover.

As an actor, the interviewer will follow the given guide and play their part as an interested and invested conversation partner and only deviate to get more depth or ask a follow-up question. Interviewers need to deliver their lines, routines, and movements like actors, while also being attentive to the other person's cues and responses. This involves listening carefully to avoid interrupting and remaining nonjudgmental to encourage open communication from the interviewee (Lune & Berg. 2016).

We also directed the interview to important topics or questions that we would like the interviewee to focus on. An interviewer should also take on the role of a director. As a director, they must be mindful of their performance as well as that of the interviewee. They must reflect on each section of the interview, assessing their own performance and responding to cues from the interviewee (Lune & Berg. 2016).

Finally, as a choreographer, it was our job to control the interview process from start to finish. In order to do this we used the concept of "listening with the third ear." This involves using information given by the interviewee to control the interview process. By doing so, interviewers can effectively plan their own movements and responses, similar to a choreographer. In order to get the desired result from an interview(Lune & Berg. 2016).

When we performed the semi-structured interview it is important to note particular strategies that were employed to get better information from the interviewee. Before we even began, we followed a few steps to put ourselves in the best position to have a successful interview. The interviews took place in as comfortable and welcoming a location as possible, most were at the Carlos Conde Marin School with our liaisons, and a moment was taken to address if the interviewee needs anything before we begin (water, snacks, etc.).

Initially, when the interview began a moment was taken to connect with the interviewee to begin to build a rapport and trust in the relationship this can lead to more open and honest conversation later in the interview. For example when we interviewed Glenney Trinidad Alvarez, One of the Founders of the La Conde Project, we took the time to ask about how she became connected with the project and what the school meant to her. The interviewer needed to have a guide to ensure that proper sequencing is achieved to keep the conversation on task and appropriate for the goals of the interview. A great technique that we used to keep your interviewee engaged and answering the questions you want them to was

1. Start with a few easy, non-threatening questions.
2. Next, begin with some of the more important questions for the study topic (preferably not the most sensitive questions)—the questions should stick to a single concept or topic.
3. More sensitive questions can follow (those related to the initiated topic).
4. Ask validating questions (questions restating important or sensitive questions, worded differently than previously asked).
5. Begin the next important topic or conceptual area of questions (these may include the more or most sensitive questions).
6. Repeat steps 3 and 4, and so on, through your major topics.
7. Return to any key concepts that you might have had to bypass or skim through when they first came up.
8. End by filling in any remaining simple factual points that you have not already recorded.

Lune & Berg. 2016, p.74.

It is critical to show enthusiasm and interest in the discussion at hand, we found that a good way to emphasize this was using a strategy called echoing. “it is important to convey the idea that you as an interviewer are hearing what is being said and that you are genuinely listening

and understanding. This can be accomplished through echoing what the interviewee has just said.”(89) Oftentimes when the interviewee was prompted with an echo they would delve deeper and give more information about the previous statement. However, it is important to note that an echo that pulls too much attention to the interviewer can have the inverse effect and the conversation can become too focused on the interviewer's experiences. Most of our interviewees were answering our questions to the best of their ability and are telling the truth. We must acknowledge, however, the possibility that they might not have been telling the whole truth. A language barrier also existed, and even with a translation from a translator, we may have missed the cultural meaning which could have changed the impact or meaning of an idea.

In conclusion, it was our job as interviewers to frame an interview in a way so that we could be successful in our pursuit of on-topic information from our interviewee. We triangulated multiple types or research methods in order to avoid any specific limitations or biases in an area.

3.3 Ethnographies

An ethnography is a qualitative research approach utilized to explore the cultural dynamics and social practices within specific communities. During our collaboration with Las Parceleras AfroCaribeñas, we employed ethnographic techniques to immerse ourselves in the experiences and customs of the Puerto Rican community, facilitating a nuanced understanding of their behaviors regarding volunteer practices and sentiments concerning school closures. Abandoning the idea of scientific neutrality, researchers delve into the culture being studied. The primary ethnographic methods we ultimately carried out included participant observations and in-depth interviews.

Participant observation is a methodology that allows our team to record observations by fully immersing ourselves in the routine-like activities of Puerto Ricans. Interacting with Puerto Ricans allows us to understand the root meaning of their passion for volunteering and reviving their community from the native point of view. Our team planned to do this by participating in similar volunteer activities as Puerto Ricans and recording written observations of life on the ground, giving us more detail about the culture and community. On non-work days, we joined other activities offered at the school or just had conversations with other volunteers and locals. By participating in daily activities with locals, we directly involved ourselves within the community, allowing us to gain information from those who may be reluctant to give interviews.

With participants' consent, we had audio recordings and written notes to document interactions, further developing contextual data throughout our seven weeks on the ground. To ensure the team is recalling accurate data, we recorded key phrases mentioned while in the field and took personal minutes before sharing or presenting our observations.



Figure 3.1: This photo shows Nicole and Jonah participating in an early morning zumba class at La Conde led by Dolly Santiago.

Our team focused on making these connections with the community just days, if not a couple weeks, into our collaboration. As we will further describe later in this paper, we understood more of the community's passion for the school by participating in their zumba workshops, speaking to the ceramics professor, building connections with regular visiting community members, and learning about the backstory of La Conde and the main leaders' roles for this project. By becoming invisible researchers with a reduction of participant reactivity, we took field notes that can provide accounts of observable experiences, including verbal exchanges, routines, and connections between the observed practices.

As researchers, it is vital to acknowledge and reflect upon our biases and assumptions during these participant observations to maintain credibility and trust in the community. In our collaboration with the La Conde community, it was essential to recognize we have not undergone the impact of a dreadful hurricane nor the impact of the loss of public schools. Given that many

locals lack access to formal education, it was important for us to listen attentively to the community members and demonstrate empathy towards their perspectives.

3.4 Limitations and Ethical Considerations

An important limitation regarding literature review we have taken into consideration is selection bias. David Collier defined selection bias as "occurring when the nonrandom selection of cases results in inferences, based on the resulting sample, that are not statistically representative of the population" (Lustick, 1996). In order to mitigate selection bias we utilized triangulation, which is "a qualitative research strategy to test validity through the convergence of information from different sources" (Patton, 1999). Our team recognized the importance of triangulating reliable sources and the diverse perspectives they provide when answering our research question. We prioritized peer-reviewed sources in our triangulation process to enhance credibility. These sources underwent thorough revisions by experts in their respective fields, making them reliable standalone references. Our literature review consists of sources found during our archival research in support of our main objectives.

Additionally, we interviewed community members primarily during the weekdays, which excluded a portion of the population that was not able to share their experiences and opinions. There was also a language barrier, and even with a translation from a translator or one of our conversational group members, we may have missed the cultural significance of some words or phrases which could change the impact or meaning of an idea.

We assumed that our interviewees answered our questions to the best of their ability and told the truth because they have no reason to mislead us. That being said, we must acknowledge the possibility that they might not have been telling the whole truth. This could be for a few different reasons, including the fact that people's memories fade, their intentions do not always match their actions, and they may hold back information for any number of personal reasons (Lune, H., & Berg, p.93). These issues do not invalidate the information we got from the interview, but it must be acknowledged and understood that there are limitations when dealing with creating connections and assumptions based on human experience and natural conversations between community members.

One of the largest limitations when looking into ethnography is observer bias. The culture in Puerto Rico is much different than our culture in Massachusetts. We are full-time students at

an engineering school, and many of the people we interact with likely did not have had the same opportunities. We did not feel the same devastating aftermath of Hurricane Maria or see the impact it had on the communities where we will be working. To ease this inherent bias, we did our best to be fully immersed in the experiences and cultural norms of the San Antón, Saint-Just, and Los Mirtos communities. We connected with the locals through community lunches and zumba to talk to and learn from people with many different perspectives and experiences. We tried to talk to a range of people across different demographics including community leaders, elders, and children, to build the knowledge we needed to construct a deeper understanding of the community. We made it a priority to listen and reserve judgment.



Figure 3.2: Glenny and Pooja discussing the impact of La Conde in the community.

A necessary perspective in viewing the ethics of our methodology pertains to recognizing the historical influence of the United States and its relationship with Puerto Rico. Informed consent is a key ethical issue in any project in which we interview and work with locals. An extreme yet informative example of this idea of informed consent comes from the sterilization of hundreds of Puerto Rican women in the 1950s. These women were not informed of the permanent nature of the sterilization they received.

Our interactions with community members were significantly less risky than medical procedures, but it is important to consider the historical impact this can have on a small island like Puerto Rico, where the community members may not be especially trusting of United States organizations asking them a bunch of questions. We did not want to shove a piece of paper with a long consent form in the interviewee's face and make them sign it, but we did need to clarify that their responses can be used in our report and we will have a discussion about the use of their personal information (Lune & Berg. 2016, p.48). If an interviewee requests to stay anonymous we must adhere to their wish. We asked each interviewee if they are comfortable having their first, last, or first and last name recorded for our report. We also asked if we may describe relevant personal information in our report, like their age, gender, and where they are from.

Before conducting our interviews with the community members involved in La Conde, we needed to gain their consent to use the information they shared with us in our report. Included in this, is the fact that we need to discuss how this information will be used. (Lune, H., & Berg, p.4) indicates that we should provide the interviewees with the hypothesis or goal of our interview, as this can invalidate their responses. We needed to let them talk, especially because we may be asking them about topics that they have emotional connections to or opinions on, and we did not want to block this conversation in order to have them respond in a way that simply fits our agenda and backs our assumptions. At the same time, we gave them enough information so that they knew where the information they shared with us was going and what we would be discussing. We told the interviewees that there was very little risk involved in answering our questions, and we would work to eliminate any risks they may be fearful of.

Another consideration to note is that we interviewed community members. These community members are mostly adults who can give informed consent during our conversation-based interview. However, if we interviewed anyone under the age of 18, we would need to be granted consent by their legal guardian or organization and may need to discuss more formal consent in order to reference their responses to our questions. We also needed to secure the responses we received from our interviews. We did not discuss responses with other interviewees or other members who are not directly a part of our research.

4.0 The Exhibition: Value, Deliverables, and Findings

This chapter presents the project's final outcomes, while explaining the improvements and updates we made throughout the seven week process. We initially planned to implement a volunteer management system; however, upon our arrival our liaisons voiced challenges with organizing participant attendance and managing the inventory. We quickly adapted and began brainstorming accessible technology solutions to increase data management efficiency. To ensure the sustainability of our deliverables, we created training manuals customized to La Conde's specific needs. Finally, it is important for community members to be informed on safety protocols in case of any emergencies while at the community center. Our team outlined escape routes for all buildings on the campus, successfully increasing security awareness.

The community center has some existing paper forms that are used for general organization and reporting on activity. These forms include an inventory system used to keep track of food and medical supplies, a participation form used to report how many community members are participating in each event in order to gain funding, and an aerial view mapping the campus used for planning of future projects. Each of these systems can be modified into an online version in an effort to help streamline and improve upon the benefits of having a system like it. First, the inventory system currently consists of a paper order and cooking sheet, however these quantities are not recorded anywhere, making it difficult to know if there is too much or not enough of a specific item when it is time to order. In order to help alleviate some of these issues, our team can make a google form system that prompts the user with a few questions including whether they are buying or cooking, what items are being used, and in what quantities. These responses can be used to populate an easy to read google sheet that the volunteers can use to monitor current inventory without needing to edit the sheet themselves. The paper participant sign-in sheet has run into some problems because of the need to track down and remind each participant to sign in if they had not already, in addition to this the volunteers need to digitize these copies and share this with the agency that provides funding and this can be an extremely time consuming process. In order to alleviate some of these issues, our group plans to develop a sign in kiosk with a google form that can populate another google sheet for easy submissions for funding. In addition to solving that problem, having a kiosk presented before entry to the community center will allow for a much higher percentage of sign ins as well as allowing those without smartphones or technology experience to sign in just as easily as those who do. Finally

the top down view of the school's campus is an excellent planning tool; however, the community center would like to create floor plans for each specific building containing information on what to do in the event of an emergency and other pertinent information.



Figure 4.1: Descriptive headers for the Google forms created for La Conde including the two inventory management forms (top) and participant management forms (bottom).

The inventory management consists of three main deliverables, the cooking and shopping form, the donations form, and the display sheet. The donations form is used to track donations received from other organizations or the government, detailing the type of donation and quantity of each supply. The cooking and shopping form allows users to add and subtract food quantities from the inventory list, essential for shopping and meal preparation. The user can pick what ingredients they are using and the quantity of each one. The inventory sheet does analysis on the responses from the previous forms and displays the current inventory of all food and donated supplies, indicating storage locations and highlighting low quantities for creating shoppings lists.

In terms of participant management, we created a participant registration form to track community members participating in La Conde's workshops and activities, recording their name and which activity they participated in. The participant registration sheet displays collected participant data which can be filtered by month, year, and activity, to showcase the impact of La Conde's workshops on the community. Additionally, the participant comments form enables community members to provide feedback on workshops, facilitating improvement and growth. The participant comments sheet organizes form responses, displaying the percentage of participants enjoying different workshops and additional comments, which can be filtered by month, year, and activity to track trends.



Figure 4.3: Emergency map of the entire campus created for La Conde in case of emergency evacuation.

We also mapped out the floor plans of the buildings to create emergency maps. After we had created a few of the building's floor plans and begun to create the campus emergency planning map, we had a conversation with Glennie about the most important elements of the campus to include. These elements included fire extinguishers, wheelchair accessible routes, and first aid kits. We learned that there would soon be an inspector coming by to make sure the property was being managed properly and La Conde was able to use our floor plans as proof that they were taking steps towards creating a plan of action in the event of an emergency.

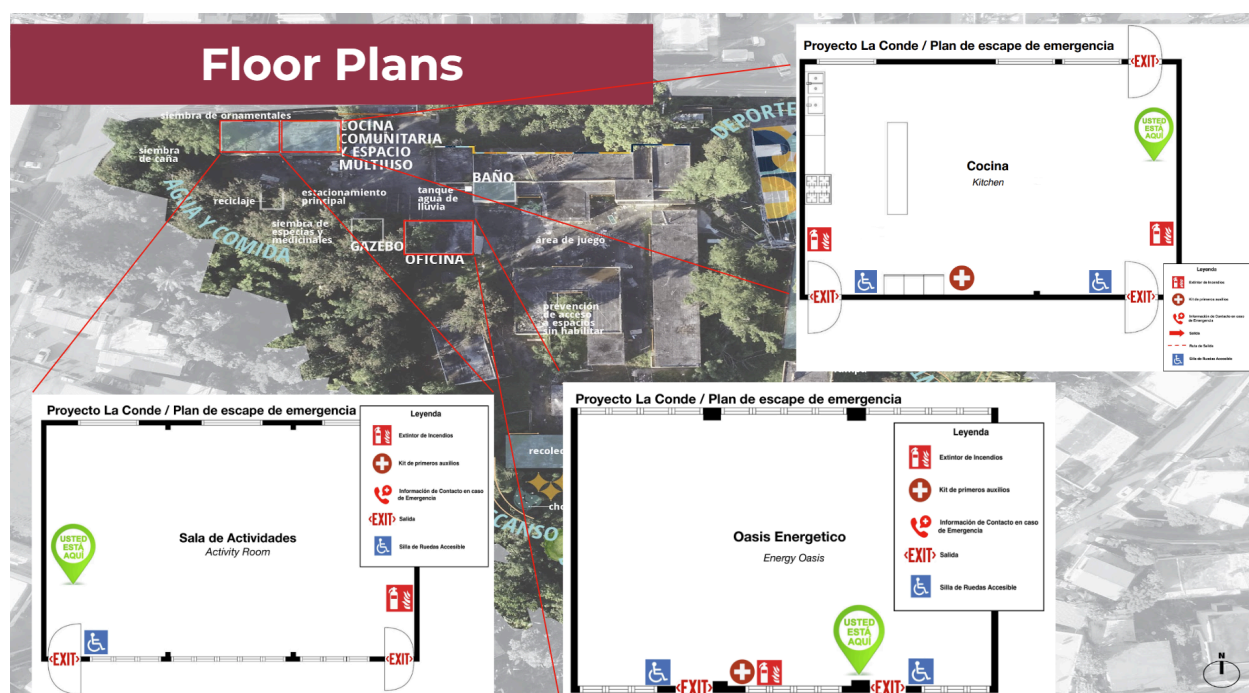


Figure 4.4: A visualization of the emergency escape plans designed for the three rooms currently in-use; the Kitchen, Activity room, and Energy Oasis. Outlined on the legends include: fire extinguishers, first aid kits, exit locations, and handicap accessible exits.

We first built a relationship with Parceleras Afroaribeñas through participating in programs at La Conde and forming connections with locals to learn more about their stories and the project itself. By week two, we began designing prototypes of our deliverables and working closely with Glenny, Dolly S., and Dolly D. Up until week 6, we implemented feedback we received from the community to polish up our final products. Lastly, our team presented our work to the community and finalized our report for publication.

4.1 La Conde is Valuable to the Community

The impact of La Conde's community center is visible every day. It serves as a cornerstone for social interaction and support, especially for the older community in Trujillo Alto. During our time in San Antón, we observed the impact of La Conde's activities on the community. The space is led by incredibly powerful black women and fosters a sense of community as soon as you enter the premise. One of the most impactful aspects of our experience was witnessing the daily routines of community members. Throughout our time, we

got to know many regulars who interacted with us almost every day. We witnessed that for many, the zumba classes and community lunches were about more than exercising and eating. They were a lifeline to social connection and emotional well-being. Every time someone walks in during lunch, a chorus of community members would wish them "¡Buen provecho!", making the space feel more like a family meal than a cafeteria. The sense of community at La Conde extends beyond the scheduled workshops and lunch, it is a place where people gather to share stories and laugh. We found that La Conde is more than a physical space, it is a hub of social interaction and support that boosts the lives of all who participate.



Figure 4.5: (from left to right) Dolly S., Glenny, and Dolly D. serving lunch at the community kitchen.

La Conde places special emphasis on the younger generations as this initiative would not exist without them. What was the end of the elementary school turned into the beginning of a community center that plans to expand on what the elementary school was able to provide for them and their parents' generations. They host a variety of programs dedicated to the youth, from vibrant summer camps to captivating theater shows, art and dance programs, to ceramics, the community is committed to cultivating success for the next generation. These endeavors stem from a genuine commitment among community leaders, many who are parents, to foster not only the present well-being but also the future prosperity of the neighborhood's children.

The support amongst the community is not constrained only within the walls of La Conde. In general, older communities are often neglected and not properly cared for, but Glenny is committed to ensuring no one in the community is forgotten. After work, she delivers home-cooked meals to those who cannot physically attend community lunches. These thoughtful gestures go a long way and create a sense of unity between such a large and diverse group, successfully embodying La Conde's mission of being a community-driven initiative.

As Puerto Rico heads into hurricane season, frequent floods plague the windy roads of San Antón, resulting in many community members' homes being flooded. Glenny and other neighbors rushed over to Dolly S.'s mothers house whose first floor was fully coated in water after three days of torrential downpours. After long and difficult work days they selflessly swept the water away using brooms and mops to save the home from facing further damages, getting drenched in the process. These are only a few examples of how the community does not hesitate to take care of one another in troubling times, and would gladly do it again. The unconditional support amongst the San Anton community feels more like a family, and the La Conde project is the center of it all.

4.2 Marginalized Areas Require Significant Aid in Technology Adaptation

Working with an older community presented unique challenges, especially in digitalizing La Conde's participant management. Many community members are not familiar with digital tools and forms, and some are unable to read or write. This posed a significant barrier in designing the participant management and inventory systems.

To solve these challenges, we first provided extensive training for Dolly who manages the kitchen and cooking and will be the primary user of the inventory system. We created detailed walkthrough manuals for the digital forms, with step-by-step instructions in both English and Spanish. We also conducted in-person training sessions to ensure that Dolly felt comfortable using the new systems.

Second, we designed the forms and inventory display sheet to be as user-friendly as possible, with simple interfaces and intuitive designs. We wanted to reduce the number of clicks and scrolls for a user so that the systems could be used as smoothly as possible. For example, we

used happy and sad icons with green and red highlights on the workshop feedback form so that anyone could leave their opinions without necessarily needing to write. These solutions worked in overcoming the initial challenges, and we were able to make systems that anyone could benefit from, regardless of digital literacy or language skills.

Connecting with community members proved challenging, given the language barrier, making interactions less straightforward. To get around the language barrier, we spoke the best Spanish we could to the community members, and everyone was patient with each other in trying to understand. When we taught Dolly how to use the forms, we explained the process visually, using key words and phrases like “*pon esto aquí*” or “*de aquí para allá*” to aid the visual explanation.

¿A qué taller asististe? *

Choose ▾

¿Cómo estuvo el programa de La Condes hoy? *

☐ Muy Bien!

☐ bueno

☐ Mal

¿Tienes algún comentario o sugerencia?

Your answer

Submit Clear form

Figure 4.6: The user-friendly “Comentarios de los Participantes” form participants can quickly submit to provide feedback on programs at La Conde.

Leaving La Conde, we expressed some ideas to improve the community's confidence with technology. Currently, Dolly goes around workshops collecting participants' names. This is the best way she has found to make sure everyone signs in, but it creates tedious work for her. Having the community members fill out the participation forms instead of Dolly would be a

great introduction to using technology and forms, and would provide some basic familiarity while taking some stress away from Dolly. Instead of going around with the form on a tablet, she could leave it on the table so it is the first thing the community members see when they walk in. Using a tablet like the image shown in figure 4.4, community members can become more familiar with technology in a low risk situation.

Additionally, Glenny has explained to us that when community members get a new phone or laptop, they often rely on her to set it up for them and teach them how to use it. While Glenny is an invaluable resource, her busy schedule precludes her from providing this constant individual training. Offering technology workshops at La Conde is another way to greatly increase familiarity of technology among the community.

4.3 Simple Technological Solutions Greatly Increase Organizational Efficiency

The inventory management system we have designed will completely change the way La Conde manages its kitchen supplies. Before, keeping track of ingredients and quantities was done by hand on daily menu sheets. This system was error-prone and did not account for where ingredients were stored. Glenny and Dolly expressed that they would often forget about donated food because they were stored somewhere else, so they ended up spoiling or being completely forgotten. With our digital system, Dolly can easily input new ingredients when they go shopping, and subtract ingredients when she cooks, in real time. The simple input form and inventory display sheet makes it easy for users who are less confident in using digital systems. The system also generates alerts for low-stock items and displays where different ingredients are stored, so that Dolly no longer has to worry about keeping track of specific quantities or locations. The final product took a while to create because we did many test rounds with Dolly. When she had issues with the complexity of the forms, we simplified it. When she was worried about keeping track of where food was stored, we added a location tab. We learned a lot about how to complete a project for a user, because even though we thought the system seemed perfect the first time, we learned the importance of testing and taking users' complaints seriously in order to create a finished product that we can be proud of and they can efficiently use. A user-centered design proved to be instrumental in creating the organizational tools La Conde was

looking for. Creating a complex system may increase the power of the program, but if it is not user-friendly then the efficiency of the system will be compromised, as users may struggle to navigate or utilize its features effectively. The system we created is efficient because it matches the complexity of the analytics with the simplicity of the user input, meaning La Conde can efficiently track and manage their kitchen supplies without the need for extensive training or technical expertise, saving time and reducing errors in their inventory management process.

Looking at participant management, the main goal for the liaisons was to have an easier and more efficient way to keep track of the community members who participate in the multiple activities offered at the center. Using the first week to observe how they ran workshops and understand what obstacles they faced from the liaisons' perspectives, we noticed how difficult it was to manage their current system and make it sustainable. Their previous system was to have a paper sign-in sheet, where they expected participants to come in and immediately sign their names. After attending our zumba class, we realized participants who came in late would forget to sign their names. Though some stayed to socialize, others immediately left after the workshop ended, ultimately leaving without signing in. Many times, Dolly had to remind them to come back to sign in or would write their names in for them if they forgot.

Another issue we had to account for was straying away from paper forms. Digitalizing these forms makes it easier to send the results to government officials, store data effectively, and analyze data from their programs throughout the years.

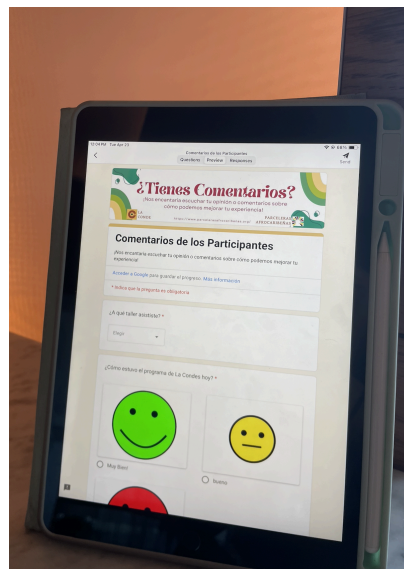


Figure 4.7: The participant form displayed on a tablet for simple use.

Our team brainstormed to create a Google Form “Hoja de Registro de Participantes” that would take in the participants’ names and the workshops they participated in. Initially, we thought of providing a QR code the community can scan. The QR code would be placed behind the instructor for the workshop so that even if a member were late, they would still remember to scan the QR code. However, we shortly learned that within the primarily elderly community, a few members had access to basic phones; if not, no access at all. Some had trouble reading and writing, as well. Our team had to prioritize a method accessible to everyone who wanted to participate in the activities.

We were happy to see that our liaisons had tablets so we saw the most effective way to portray the form was on a tablet, which would be placed at the entrance of the room at the beginning of every activity. To ensure a quick, concise display, we created a form with only two questions to remove any scrolling for the community members.

Switching over to the sustainability of the system, we had to figure out a way to easily send the names for the annual government checkup, while storing years' worth of data that could be analyzed. Google Forms can automatically connect to Google Sheets, helping viewers see the display of data throughout the years. For the administrative aspect, we structured the sheets to portray all the data entered with the ability to filter by year, month, and workshop. In terms of the annual government checkup, the display sheet shows a list of the names and the date, and it calculates the total number of participants based on the filter applied.

Another form that needed to be digitized was their evaluation form, which served to gain insight into which workshops are a fan favorite and which ones have suggestions. Their previous form was a full page with multiple small multiple-choice and some open-ended questions. To make the form more interactive and entertaining, we created another Google Form “Comentarios de los Participantes” aimed to be presented on a tablet. Circling back to the priority of allowing those who have trouble reading and writing to still give input, we learned that it is important to gauge every member’s preference and to keep it concise so that they are still likely to fill out the form.

4.4 Use Simple Accessible Trainings to Improve Informational Technology Understanding

While developing the user manuals, we found that pairing a screenshot along with each action helped to provide context and clarity. For example during the first test round of the cooking and buying form, the instructions were only in English. We presented these two deliverables to both Glenny and Dolly simultaneously. During this process Glenny acted as our translator as Dolly only speaks Spanish. We explained each step of the form and highlighted the key features like the ability to select up to 25 listed items and add 5 new items per each form submission. We also explained how the form has no required sections so that any number or combination of items could be selected. During this process Dolly explained to us that the screenshots were the most helpful for her to understand.

Formulario de Donaciones (Donations Form)

[Formulario de Donaciones - Google Forms](#)

[Inventario - Google Sheets](#)

Notas importantes(Important Notes)

- **Para sumar o restar de "Objetos Donados", la ortografía y las mayúsculas de la entrada del formulario deben ser las mismas que figuran en la lista del inventario.**
To add or subtract from "Objetos Donados", The spelling and capitalization of the form entry must be the same as listed on the inventory list.
- **Para restar un artículo de la hoja de donaciones, se debe ingresar un número negativo en el formulario**
In order to subtract an item from the donations sheet a negative number needs to be entered into the form

¿Compraste o usaste más artículos?
Did you buy or use more items?

☒ Yes
☐ No

Clear selection

Back Next Clear form

Figure 4.8: Excerpts from the training manual including important notes and highlighted action button.

In response to this we improved and added screenshots to the manual by zooming in on the specific section/question and highlighting specific actions in the screenshots. In addition to this we translated all directions to Spanish and put them in bold, as the manuals are designed primarily for Dolly. We added English translations in smaller italics alongside Spanish directions to increase accessibility for other users and provide an immersive language learning experience whenever the manual is used. The second run through of the user manuals included both the cooking and buying form as well as the donations form manuals. In this instance all directions had been translated and all screenshots had been improved. This run through was only with Dolly, to ensure that she would be able to use the forms with no assistance besides the user manuals. This time our test was a success and Dolly was able to use the manuals with no hiccups. Prior to the final iteration of the cooking and buying form we made a few user manual guides that give examples of a few basic form functions like copying questions/sections and editing/adding questions/sections. These guides are located in a separate document along with an accumulation of other Google online learning tools that will be shared with the PRPC for any community center or liaison to use to learn more about Google Sheets, Forms and the rest of the Google suite.

4.5 Reflection

Our experience working with La Conde has been incredibly rewarding and has taught us valuable lessons about community engagement and project management. One important lesson we learned is the importance of flexibility and adaptability when working with an organization in a community setting. We had to constantly reassess our approach and completely redo our deliverables. For example, we designed a preliminary inventory form and corresponding display sheet, but Glenny and Dolly expressed issues with the complexity of the form. We had new sections on the form for each ingredient, and the user had to go through every section and say if they did or did not use the ingredient. The user would have to continuously scroll and click, so we completely reimagined the form to include a dropdown of any ingredient you want, and put 5 ingredients in a single section. This also meant we had to redo the entire coding and math section of the Google sheet, but it was well worth it to create a product that the organization would be happy with. On an even larger scale, our entire project changed as soon as we touched down in Puerto Rico. We expected to be doing a project on volunteer management, but instead ended up

with inventory management, participant management, IT training, and maps of the whole campus for emergency escape routes. We were able to adapt a lot of our Google suite and IT training information to fit the new objectives, and we were flexible in creating brand new objectives we had not been expecting. This adaptability is important when working on a project, and we learned how to roll with new tasks and challenges wherever they popped up.

The project also highlighted the value of clear communication and collaboration, both within our team and between the La Conde community. We asked Glenny questions all the time about how she would prefer something be displayed, or what type of information she wants collected. This open communication with our liaison proved invaluable as we delivered products that are extremely tailored to La Conde and their specific needs. Our group also had great intra-team communication, and everyone was able to be constantly working without stepping on each other's toes. At the same time, we always supported each other whenever someone was stuck or needed some new ideas. Moving forward, we will be able to apply these lessons to future projects, ensuring we continue to make a positive impact in the communities we work with.

5.0 Conclusion

5.1 Deliverables

Our project's mission was to empower the La Conde community through technology by creating inventory and participation management systems to allow for organizational efficiency and to design emergency plans to enable safety protocols. At the end of our project, our team aims to provide the La Conde project with four major deliverables. First, we created an inventory management system as well as a participant management system to digitize their organizational efficiency. Additionally, we created an IT training manual to ensure Dolly S. and Dolly D. become familiar with our systems. We also created emergency escape floor plans to provide guidance in the event of an emergency.

5.2 Impact and Limitations

Our team hopes that our contributions will enable all volunteers at La Conde to fully understand and utilize Google tools, ensuring the sustainability of our deliverables. This will empower anyone to make necessary adjustments to Google Forms, Sheets visualizations, floor plans, or emergency routes in the future. By educating and training volunteers in such versatile software, we aimed to boost the community's self-confidence and motivation. Furthermore, we hope that our methods for organizing participant attendance and inventory systems, as well as creating campus floor layouts, can be replicated not only at Carlos Conde Marín School but also in other abandoned schools across Puerto Rico.

With only seven weeks in Puerto Rico to complete our project, our team acknowledged we had limited time to conduct extensive interviews, analyze the data we observe, and ultimately complete our final deliverables by the end of April. To help with the sustainability of these deliverables, we recommend a few actions the organization should take. Currently only the leaders of the project know about how the participants' attendance form works. To further increase efficiency, it would be beneficial for them to implement a routine for the participants themselves to fill out the form as soon as they enter a specific workshop. With three buildings the community members currently hold activities in, we anticipate renovations to happen for the

rest of the buildings. The floor layouts will consequently change over time. For the safety of the community, it is crucial for them to ensure all emergency routes are up to date. With future successful collaborations with WPI PRPC and La Conde, it may be important think about how else we can help this organization. Firstly, Glenny has emphasized the challenges of cleaning days at the campus, which involve long hours and limited resources. Organizing a large-scale cleaning event, with brochures distributed to local communities and other non-profits, could enhance networking and attract further donations. Additionally, Glenny noted the community's limited exposure to technology. With our new deliverables focused on digital approaches, the community would benefit from having small technology workshops that could introduce them to this digital world, build their confidence, and encourage further learning.

The completion of this project has made the liaison's day to day operations much more streamlined, ultimately shining a light on all of the ongoing, planned, and completed projects. It has reduced the future time and effort Glenny would have to put in to sort data or find missing data, which she initially would have to do. With a click of a button, she can send information about how the organization is running to the government- an action that used to take hours.

Not only did our deliverables impact the organization, but they also provided a significant learning experience for our team. Overall, it was an amazing opportunity to learn more about the organization's goals and the passion behind their commitment to this school. During our first week onsite, Glenny gave us a tour of the campus, while giving us a rundown of her contribution to the organization and her history with the school itself. During our first week on-site, Glenny gave us a tour of the campus and shared her contributions to the organization and her history with the school. Although we had researched the school's challenges, hearing about the magnitude of their struggles firsthand was shocking and showed us how deeply the community was affected. Throughout joining their lunch distributions three times a week and going to a few zumba classes, we bonded with other community members who shared their stories. Hearing the variety of backgrounds, our team took on a new perspective.

As a whole, our team was extremely fortunate to collaborate with such a welcoming community and work with each other, especially with different majors across the board. With this variety, we were able to form ideas from different angles and discuss the best action to take for the benefit of the organization. Working with a nonprofit was rewarding; every visit to the site reinforced that we were making a difference and alleviating some of the leaders' burdens.

Specifically, assisting Parceleras AfroCaribeñas meant supporting a community that has faced repeated marginalization. This project instilled a sense of importance and pride in our work. We anticipated challenges with language barriers since, although two of our group members could converse in Spanish, none of us were fluent. We knew that the fast pace of spoken Spanish might make it difficult to understand and respond to follow-up questions. We understood the speed of them talking in Spanish may cause difficulties for us to understand and ask follow-up questions. When teaching volunteers how our deliverables worked and generally interacting with other community members, we made sure to find other approaches if we did not understand each other, and we were ultimately complimented for our patience. Additionally, we developed the ability to remain open-minded and adapt to sudden changes in the project, even if they deviated from our initial plans.

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