ENVIRONMENTAL EDUCATION IN LATINO COMMUNITIES: SHARING EXPERIENCES

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Photo Courtesy of Juan Flores

Introduction

During the last decade, mainstream environmental and conservation organizations have begun to realize the importance of improving equity, diversity and inclusion in environmental education and sustainability efforts. There is a true desire to engage communities that have historically not been included in the decision-making process. Some progress has been made but the needle has not moved much; the traditional Environmental Education movement (EE) continues to be led by mostly white, affluent, highly educated individuals and mainstream organizations. Programs, publications, and stewardship efforts ultimately still benefit only a few. When one looks beyond traditional EE and sustainability circles though, it becomes clear that there is a lot of top-notch work that is being led by underrepresented communities. Yet, these efforts are generally not recognized as environmental sustainability work and therefore are not valued by the movement. On the other hand, many communities simply don't identify with the traditional EE movement. The movement's values, approaches, and priorities may not mirror their thinking. How can we come together? For progress and change to occur we must look beyond mainstream understanding of what constitutes environmental sustainability work and environmental education. To develop effective programs and partnerships it is necessary to have a transparent and honest dialogue. To create lasting impact we must come together by recognizing work that goes beyond traditional EE circles, and by understanding the strengths, needs, priorities and goals of all communities.

It is predicted that by 2060, nearly almost 30 percent of U.S. citizens will be of Latino origin, (U.S. Census Bureau, 2015). Latinos have become an integral part of the fabric of life in the United States. Yet, few Latino voices and Latino-led environmental education efforts are recognized. Latino community leaders and educators are doing transformative work in their neighborhoods throughout the conti-

nent. Their focus on sustainability, outdoor education, conservation, sustainable innovation, and values-based impact programing is being felt throughout the Americas. Latino leaders know their community strengths and aspirations and work within those strengths. They use innovative methods to engage their participants in environmental education activities, advocate for a democratization of the sciences, and engage in stewardship programming that is relevant to their communities. More importantly, they appear to be effective and represent a real movement within Latino communities. These experiences and successes may not be well known by the mainstream environmental movement because they may not look like 'traditional' environmental education efforts. Moreover, Latino community leaders and their allies have not been an integral part of the mainstream environmental movement. These experiences and viewpoints are missing.

This is why, as part of a greater effort to integrate the perspectives, vision and strengths of diverse communities in environmental leadership and stewardship, the United States Environmental Protection Agency (EPA), through its National Training Program, EECapacity, supported the implementation of an online bilingual space for the dialogue and the exchange of ideas between educators and community leaders. This space encouraged the sharing of experiences and resources among formal and informal Latino educators, grassroots advocates and traditional environmental educators who are working with Latino communities in the United States, Mexico, Puerto Rico, and Cuba. Three moderators, Marta, Karen and Pepe, who themselves are immigrants to the United States. and who are also the editors of this eBook, were in charge of fostering and incentivizing this dialogue. Fifty participants were added to the online learning community, where they openly collaborated to learn from one another, exchanged ideas, shared their viewpoints, and worked on creating this eBook. During almost a year of dialogue, the learning community explored Latino-led initiatives as well as the many perspectives and experiences. We explored the work that many different types of organizations such as museums, community centers, large NGOs, and religious groups faced when implementing environmental education programs in Latino communities. Collectively we learned about community efforts that go further than simply translating

and adapting traditional EE materials. The culmination of this project led to this online publication. The participants of this collective work hope that sharing these experiences publicly elevates the exciting work that is already taking place in Latino communities. In addition we wish to inspire environmental educators, institutions, and community leaders to develop activities and environmental education programs contextualized to the needs, resources and objectives of the communities that they serve. Not all of the members of this online learning community participated in creating the final version of this eBook. However, all of the participants contributed to its message by sharing their perspectives with the rest of the group during the first months of open discussions, helping to give a sense and direction to the eBook. The authors of the eBook worked hard on their chapters to express and share their wisdoms, perspectives and what they learned from the group's dialogue. Their wish to share their experiences to elevate environmental education in Latino communities inspired them to engage in a constructive exchange of ideas.

The first chapter takes us to the world of the arts. Jose Miguel, Steve and Andi, tell us their experiences, challenges, and successes in their respective communities in New York, Louisiana and California. They show us how youth build their self-esteem through participation in a theatre group that aims to give powerful environmental and values-based messages to their community; how youth use the visual and plastic arts to break cultural barriers and create stunning gardens for their schools; and how people of all ages who participate in festive street events can learn about important species and conservation. In the second chapter, Cecilia, Naylien, Samuel and Juan take us to Mexico and Cuba. They focus on how learning about birds and bird watching can be a great way to connect people of all ages to each other and to nature. In addition, they showcase how programming promotes the local economy, and creates awareness about the environment and the illegal bird trade. In addition, the authors discuss how they inspire their communities to take concrete and effective actions for the benefit of birds, the environment, and people.

In the third chapter, Liz, Laurie and Ricardo, discuss community gardens in Mexico and Minnesota. The chapter delves into how to create a community garden, and more importantly the impact that it can have on a community by becoming a space with a common purpose for people. They argue that a community garden can become a place to build bridges and alleviate tensions among different cultures and groups living in the same neighborhood. In addition, it can be a place to teach farming skills to newcomers searching for new job options and be a source of healthy food and income for families. The fourth chapter discusses the creative solutions employed by certain institutions, like museums, which face difficulties in reaching isolated or underserved communities. Samuel and Gabriela tell us of the experiences of a traveling museum in northern Mexico. This museum, takes exhibitions about birds on the road, and teaches environmental education with a focus on birds, their habitats, and their conservation to people who wouldn't otherwise have access to this information.

In the fifth chapter, Sarah shares the importance of mentorship and early life experiences. She argues that it is key for youth to be exposed early to people who inspire them, to have experiences in natural wild areas, and to be exposed directly to local environmental problems. Sarah showcases examples and citations from Illinois, to highlight possible pathways to create a deep and positive impact on young people's aspirations, environmental knowledge and stewardship in the long run. Rosalina and Elizabeth show us in the sixth chapter how family businesses adopt forest conservation and engage in sustainable agriculture in Puerto Rico. The authors focus on how communities promote local economic growth while also protecting the environment. The cases presented in the chapter are excellent examples of sustainable innovation.

In the seventh chapter, Michelle tells us of her experiences teaching environmental education to English language learners in New York City, in mixed classroom settings where other students are native English speakers. She shares ways she used hands-on experiences and interactive teaching tools to bring home the

idea that taking care of the environment is everyone's responsibility, even in urban settings.

Lastly, in the eighth chapter, Roberto tells us about his experience working with students in a semi-rural area of Mexico, where youth were engaged, and actively participated in understanding the social and environmental context of their community. The youth role in the research was to gather information that would aid the development of methodologies and programs for community environmental education. However, this experience had a much greater impact on youth participants because it made them conscious citizens, aware of their community's environmental issues.

This eBook is composed of a wide spectrum of shared experiences that we hope will inspire many. We would like readers to begin to think differently about environmental education and what it looks like. This is the beginning of a conversation in which exceptional work already being done in underserved communities is recognized and elevated. Not all Latino communities are the same — each has its own peculiarities, strengths, challenges and cultural nuances. Successful and effective engagement with Latino communities requires an open conversation with particular communities and immersion in the knowledge of the leaders and actors of these communities. It is just as essential to search for common goals that enrich the quality of life of the people in the communities. But finally, and above all, the community itself and its work must be recognized.

Marta, Karen and Pepe.

CHAPTER 1

Opening Eyes and Hearts with the Arts

Jose Miguel Hernandez Hurtado, Stephen D. Porter and Andi Wong

The arts-- visual art, music, dance, theatre, and literary arts-- offer fertile ground for building respect and connection between human beings and the natural world. Early engagement in the arts may help to instill a love of nature in children that will last a lifetime. White and Stoecklin (1998) have shown that "autonomous, unmediated" contact with nature effectively develops both love and concern for the environment. They find that when children learn about the natural world, their lives are enriched "by intimately knowing the wonder of nature's complexity in a particular place that leads to a full appreciation of the immense beauty of the planet as a whole."

In this chapter, three arts educators working with youth in arts programs in New York, Louisiana, and California, share their thoughts on the benefits of using las artes, or the arts, to engage Latino audiences in environmental education (EE).

Planting the Seeds

"You have to believe that things will happen, you have to work and love what you're doing."

— Gustavo Dudamel

The arts engage all of the senses: sight, smell, hearing, taste, and touch. Through hands-on arts engagement, children can learn about the world around them from an early age. Children also can learn how to convey emotions through the arts (Goldhawk, 1998). These positive experiences in self-expression can inspire empathy for all living things and help to connect the young artist to the natural world. Art builds cognitive skills, enabling children to find new solutions to com-

plex problems and synthesize information to communicate new ideas (The Arts Education Partnership, 1999). Through the arts, children learn that ideas and materials can be turned into something new with immeasurable value (Kellert, 2005). In her 1977 book, The Ecology of Imagination in Childhood psychologist Edith Cobb notes that memories of childhood experiences can enable one "to renew the power and impulse to create at its very source." Ultimately, the arts give young people a chance to actively shape their own identities and find their own voices. To give a child the time, space, and freedom to play and grow with art is to plant the seeds of love. These positive early childhood experiences often set the foundation for a lifetime of success and achievement and establish a life-long connection to nature (Mills, 2009).

Why Art?

"Feet, what do I need you for when I have wings to fly?" — Frida Kahlo

Courtesy of Stephen Porter

Every day, artists all over the world use a variety of tools and materials, gestures, and actions to express themselves and explore their relationships to their surroundings. The artistic process involves a continuous cycle of learning rooted in observation, inquiry, practice, and reflection. This cycle of learning enables young people to develop real skills through discipline and passion as they set attainable goals for themselves. Practice brings knowledge. Desire instills a passion for learning. Creative confidence encourages positive risk-taking to learn new things. The arts transform materials, environments, and people, inside and out. The arts are revolutionary, constantly testing and expanding the boundaries of what is possible, and perhaps this is one of the reasons why the arts are so enticing for children.

During his tenure, former U.S. Secretary of Education Arne Duncan said, "Arts education remains critical to leveling the playing field of opportunity" (Stevenson et al., 2014). In addition to spurring academic achievement for all students, the arts can also address and support the social and emotional needs of those who face serious life challenges. Children of immigrants often live in poverty with limited language skills and little knowledge of their new culture and environment. Without support, these children may become marginalized to the point of having their dreams erased. Parents and family members of these children are often required to work long hours in factories or other trades in order to support the family. Older students may have family responsibilities that make it difficult for them to participate in activities with extensive time commitments. In the Latino culture, "leisure activity occurs mainly in the context of family and friendship groups" (Shaull & Gramann, 1998). Arts programs can help build community and a sense of the artistic "familismo" or family relationships. Parents and other family members are usually deeply and actively concerned about their children's educational, emotional, and material well-being (National Task Force on Early Childhood Education for Hispanics, 2007). For some students, a welcoming, supportive artistic environment will provide a sense of safety and stability that may not be found at home. What's more, research studies that track the school and life success of students in arts-rich versus arts-poor schools clearly show that students in arts-rich schools attain higher achievement levels, graduate high school, and attend and graduate from college more often than students in arts-poor schools. This is especially true for minority and economically disadvantaged students, including Latinos (U.S. Department of Education, 2015).

Courtesy of Andi Wong

We will briefly introduce you now to three projects involving the arts that will be examined more closely further in our chapter.

La Joven Guardia del Teatro Latino, a youth theater group in Syracuse, New York, aims to positively influence children's futures by using the arts to connect them to their cultural roots and community. La Joven Guardia provides safe and fun learning experiences for the children, youth, and their parents. Creative Director Jose Miguel Hernandez Hurtado knows that the arts play a vital role in fostering the imagination, building self-esteem, and developing awareness of the importance of education. In addition to helping children express their curiosity and further their intellectual development, young participants in the program, are connected with outside programs that enable them to grow up in a healthy environment. Through their work in the theatre, the students become scholars who delve deeply into the literary works that become their beautiful theatrical performances.

Courtesy of Marta del Campo

Ask the question, "what is art?" and you will get a multitude of answers. The artistic disciplines (visual art, music, dance, theatre, literary arts) can be practiced individually or experienced through multidisciplinary study. One may practice "art for art's sake." The arts may be integrated with other subjects to spur student engagement. Students may use their imaginations or apply learned skills in real-world situations, as we see in some of the examples cited here.

Courtesy of Stephen Porter

The visual artists at the Bossier Parish Schools Talented Arts Program in Louisiana work with a variety of materials and artistic styles. Artist/Educator Stephen D. Porter recalls a number of murals painted by his students-- e.g., inside the cafeteria and across the street on the walls of a neighborhood store. Students also have created papier-mâché masks, constructed totem poles from recycled wood, and made a 1200-pound Easter

Island statue with a working fountain. He described all of them as "works of art created by children working together with no hidden agendas and no inflated egos: they just wanted to create."

Ask "who makes art?" and you will discover that the arts are inclusive, leveling the playing field for young and old, beginners and the accomplished. Art can be taught through formal schooling or informal mentoring. Art can be a solo endeavor (painting, poetry, or musical composition) or a collaborative effort (mural making or theatrical and orchestral performances). Teaching artist Andi Wong noted the community art-making effort for a project called The Butterfly Effect at Sunday Streets, which involved public school students and teachers: artists ranging in age from 6 to 65. Public institutions, private business, and ordinary citizens worked together to make art in the streets, helping the community to learn about the plight of the monarch butterfly, an iconic butterfly species in the United States and Mexico, known for their migratory patterns between the two countries and for their beauty. Recently, the population of the Mexico-U.S. migratory monarch butterfly has declined to dangerous low levels, with a drop in population of more than 80 percent in Central Mexico and almost 70 percent in Coastal California; at least in part, this drop in population is probably due, to human practices (Xerces Society, 2016). Thus, the monarch butterfly is a truly relevant species for environmental education and the culture and experience of Mexican immigrants in the United States because they are migratory between the two countries, just like the butterflies. As the people take up residence around Ellis Street in San Francisco's Tenderloin neighborhood with its dense concentration of children and families (approximately 4,000 living in a half square mile area), they found common ground with the monarch butterfly project. Through the arts and community events, mi-

Courtesy of Andi Wong

gratory monarch butterflies can then become a bridge between Mexican immigrant families and environmental education.

The Confluence of Light and Dark

"The most valuable possession you can own is an open heart. The most powerful weapon you can be is an instrument of peace." — Carlos Santana

Courtesy of Stephen Porter

Art builds cultural understanding, and the sharing of community stories can influence memory. Latino students may feel a deep sense of pride and belonging when they are able to share their heritage through the arts. Through the study of art, children come to understand that artists can persist and transcend borders and boundaries. Students who encounter the art of the iconic Mexican artists José Posada, José Orozco, David Siqueiros, and Diego Rivera are given a safe space to discuss difficult topics such as war and poverty. Art exists in darkness, as well as in the light.

Courtesy of Stephen Porter

The challenging conditions of poverty disproportionately impact the mental and physical health of children. Today's fast-paced world often deadens and assaults the senses of young people. Stress and fear lead to lower self-esteem, poor health, and detrimental life choices for children who lack social support. A 2006 national study found that 88 percent of Latino children have unmet mental health needs, while Latino children and youth are less likely to receive services for their mental health problems than children and youth of other ethnic groups (Masi & Cooper, 2006).

According to the theory of object relations, a positive emotional foundation enables children to explore the world with confidence and turn their attention outward in any direction (Chawla, 2006). The attention and mindfulness inspired by arts engagement can be employed to address the stress and disconnect from nature that Richard Louv (2005) has dubbed "Nature Deficit Disorder." Researchers have linked positive emotions-- especially, for example, the awe we feel when touched by the beauty of nature, art, and spirituality-- with lower levels of pro-inflammatory cytokines, which are proteins that signal the immune system to work harder (University of California - Berkeley, 2015).

A 2012 National Endowment of the Arts study, "The Arts and Achievement in At-Risk Youth" found that "socially and economically disadvantaged children and teenagers who have high levels of arts engagement or arts learning show more positive outcomes in a variety of areas than their low-arts-engaged peers" (Catterall et al., 2012). In spite of these findings, the high stakes testing climate has continued to negatively impact equitable access to a quality arts education for all children. A National Education Association (NEA) survey of public participation in the arts noted that "the decline in the rate of childhood arts education among white children is relatively insignificant from 1982 to 2008, just five percent, while the declines in the rate among African American and Hispanic children are quite substantial — 49 percent for African American and 40 percent for Hispanic children." (Rabkin & Hedberg, 2011). A life filled with art and nature and the practices of mindfulness, reflection, and gratitude can provide balance and real health benefits for people in times of growing stress and uncertainty.

Courtesy of Andi Wong

Por todo el mundo / All over the world

"My poetry was born between the hill and the river, it took its voice from the rain, and like the timber, it steeped itself in the forests." — Pablo Neruda

In recent years, new open-sourced technologies have extended the artist's reach and have become a powerful tool for change. Art "increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action" (UNESCO, Tbilisi Declaration, 1978). In a connected global world, students with arts knowledge will be better prepared to respond to the diverse needs and complex situations that lie ahead. The arts offer an expansive view of our collective humanity, and beautiful moments are created when people join hands to work together. For instance, we "see" ourselves in the colorful hands stenciled on the rock walls in 9500 B.C at the Cuevas de las Manos (The Cave of the Hands) in Argentina. In another example, consider the 2014 People's Climate March in New York City, which was infused with the vibrant colors of Latino art traditions. Gigantic puppets and colorful posters by Latino artist and activists such as Faviana Rodriguez and Cesar Maxim helped us to "feel" the energy and collective will of nearly 400,000 people marching on behalf of our planet. Posters read "Defend Our Mother" and "To Change Everything, We Need Everyone." The future will require this type of skillful communication and collaboration between diverse groups. When we pass on our artistic practices and cultural traditions to young artists, we enable them to create positive social and environmental change. Art is "an easy way for individuals to make a tangible difference" (Buckland, 2014). Together, we open up our senses, hearts and minds through art making. Together, we begin to create places filled with passion and compassion for all living things.

Courtesy of Andi Wong

Three Approaches for engaging youth through the arts

Courtesy of Priscilla Santana

La Joven Guardia del Teatro Latino (The Latino Theater Youth Troupe) is a theater group based within the Latino community in the Near West Side of Syracuse, New York. Creative director Jose Miguel Hernandez Hurtado founded the program in 1999, with the primary objective of raising self-esteem in Latino children and immigrants in the United States. La Liga Hispana, the Syracuse Spanish Action League, in the Near West Side, operates the program. This afterschool arts program is a "hub" for the Latino community and offers various programs, counseling, and community events. The theater group chooses works of Spanish literature that inspire learning and engagement for children and their families, such as a performance of Two Nightingales by José Martí, the late 19th century Cuban hero and poet. Youth, parents, and volunteers learned about literature and theater, studied several species of birds, and how to care for the environment. Student knowledge was shared via community performances and even on a local radio program. Youth in the program displayed professionalism and passion, bringing relevant cultural stories to life, helping the actors to experience the real emotions of protecting and caring for animals, the planet, and each other. There are the challenges of insufficient funding, space, and support for this ambitious program as it strives to bring the arts to the entire community, from children to the elderly. However, the benefits extend far beyond any particular play. One student describes La Joven Guardia as a vehículo, or a means, to help them understand that "hay un futuro mejor…que pueden tener una educación, que pueden llegar a las familias, que pueden superarse [there's a better future…they can have an education, they can reach out to their families, they can better themselves]" (Peterson, 2014).

Visual Arts Instructor Stephen D. Porter and student artists from the Bossier Parish Schools Talented Arts Program recently presented a student art show featuring 78 unique masks created by the students at Parkway High, Haughton High, and Haughton Middle in May 2014 at The Gallery of Fine Arts in Bossier City, Louisiana. Each mask illustrated the creativity and uniqueness of each artist. According to Steve, "Two words come to mind when using art as a positive force: relationship and opportunity. The individuals that you are working with don't have to be accomplished painters or sculptors, but when given the opportunity, relationships form. For close to twenty years, I have worked with students and non-students, from the ages of four to adult. Some were privileged, and some had nothing. The one thing in common was art. At times, I have had White, Black, Asian, Mexican, and Native American (people) in one room working… Art is what we can use to come up with solutions."

Courtesy of Stephen Porter

Courtesy of JoséMiguel Hernandez Hurtado

When working with Spanish-speaking students in his classroom, as a non-Spanish speaker, Steve has learned that his inability to speak the language can be an obstacle for clear communication. Steve began meeting with Spanish teachers afterschool to make art together, an arrangement that helps him share his thoughts and learn the language in a relaxed atmosphere. As a teacher working at many different schools, he frequently encounters the challenges of finding adequate workspace, time, and support. He wistfully recalled establishing three art gardens, working with at-risk students. Practitioners of

"placemaking" understand the rationale for iterative actions and collaborations inherent in the making of places that nourish communities and empower people (Silberberg, 2013). Today, cities across the United States, from Shreveport to San Francisco and New York, are supporting initiatives that invite open participation through engagement with the arts and nature to create sustainable, vibrant community-centered environments. Sadly, only one garden remains today from the Bossier City project. In one case, the art, outdoor mural, plants, totem poles, and statue that his students created years ago are all gone. "When we started, we did generate some curiosity. Some folks raised eyebrows with skepticism. Some were surprised it even worked, and, in some cases, it was looked at as an eyesore rather than an asset." Beauty is in the eye of the beholder, and people sometime miss the true value of student-driven work. The silver lining as Steve sees it is that for a time, the language of art bonded all cultures, the positive experiences in nature translated to a lot of smiles and beautiful memories.

Courtesy of Andi Wong

In the spring of 2014, The Luggage Store Art Gallery; ArtsEd4All, an informal collective of educators, artists, scientists, civic institutions and community organizations; and students from Rooftop Alternative K-8 School partnered to bring The Butterfly Effect to Sunday Streets in the Tenderloin district of San Francisco. The public was invited to this free event on Ellis Street to try their hand at planting and bookmaking. Little Free Library #9859 was filled with books about butterflies and other pollinators, and milkweed plants were on display. Butterfly-inspired poetry readings and musical performances by the student rock band raised awareness about the plight of the monarch butterfly and the need to protect their habitats and migratory paths. "Butterfly Wings," a special photo booth created by Rooftop School invited people passing by to imagine themselves as beautiful monarch butterflies. With no designated funding, the event was a 100 percent volunteer effort. The art activities used repurposed recycled materials, with the exception of $100 spent on

photo prints. A weekend working in the Tenderloin, one of the most crime-ridden areas in San Francisco, was not an easy sell for student volunteer participation, but the ArtsEd4All team succeeded and the hope is that inter-community participation and exchange will increase each year. Remarkably, the event inspired the host organization, The Luggage Store Art Gallery, to begin a rooftop pollinator garden project on Market Street, and plans are underway for The Hummingbird Effect, a community event that will use the arts to raise public awareness about birds and their habitats.

Conclusion

These three arts education programs illustrate different models for student participation, but each program challenges students to learn and explore new connections to self, family, community, culture, and the changing environment around them. In an ideal world, each program could benefit from more funding, more time, and more support, but artists are practiced at maintaining a positive, open mindset in the face of challenge.

These arts and environment programs provide ample opportunities for citizens of all ages to participate in creative problem solving and personal and collective storytelling, important skills that will benefit the next generation of leaders. With greater environmental challenges predicted in the years to come, young people will need to face the future with imagination, creativity, and resilience. "Globalization, bringing with it the need to embrace the broad cultural diversity around how personal and societal philosophies interoperate, will put a premium on finding more effective ways to create and share meaning and meaningfulness" (Stuckey & Nobel, 2010). The well being of the world may depend on the wisdom and compassion of opened eyes and hearts.

CHAPTER 2

Environmental education and birds: A shared flight

Cecilia Alvarez, Naylien Barreda, Samuel López, and Juan Flores

"Birds, it must be admitted, are the most exciting and most deserving of the vertebrates; they are perhaps the best entrée into the study of natural history, and a very good wedge into conservation awareness." — Roger Tory Peterson

Courtesy of Branch Brook School

Conservation of biodiversity affects all human beings. Regardless of whether you live in an urban or a rural area, there will be actions and behaviors that you can take to help reduce the human impact on the environment and its biodiversity (SEMARNAT, 2011). As environmental educators we daily face the difficulty of explaining the importance of wildlife in our communities. One way to interest people in environmental experiences and to help them connect local environmental issues to the global perspective is to introduce birds. By using resident and migratory birds, environmental educators can illustrate the diversity of species and the important roles they play in their natural environments. In this chapter, we will share our experiences based on bird watching as a tool for environmental education in three communities, one in Cuba and two in Mexico. Each addresses different audiences and social and geographical circumstances, so, there is a wealth of knowledge and learning to share.

Birds as an educational tool

Birds do not recognize borders. This means that people of different countries and different latitudes must unite through collaborative observation and research. Examples of such programs are Partners in Flight, International Migratory Bird Day, and Celebrate Urban Birds. These programs, which have been ongoing for at least ten years between the United States (U.S.), Mexico, and Central America, have developed numerous resources and materials in English and Spanish, and are accessible on the Internet (e.g., www.birdeducation.org; www.beac.org, www.birdday.org; www.celebrateurbanbirds.org). Such resources help people to know the birds of this wide geographical distribution and complement other environmental education projects in those regions.

Courtesy of Marta del Campo

The Bird Education Network (BEN, 2016) describes birds as "beautiful, accessible, iconic, international, popular…visible everywhere and are part of our history." Their behavior is fascinating and can be observed with family, friends, or alone, regardless of age (Villaseñor-Gomez & Manzano-Fisher, 2003). We can learn a lot about the environment from birds and about how we are all connected. Birds and humans share the same planet, and so by watching and understanding the environmental challenges facing birds, we can learn about our own vulnerabilities, as we are prone to many of the same threats (BEN, 2014).

Experience in Cuba: Captive bird count

Cuba is the Caribbean island country with the greatest diversity of birds: to date 369 bird species have been recorded there (Garrido & Kirckonell, 2000). Due to its geographic location—in the middle of two great continental masses, North America and South America—Cuba is considered an important point for rest and replenishment for thousands of migratory birds that twice a year migrate through

and from the insular Caribbean, between their breeding grounds and winter residences. Because of this fact, promoting respect and understanding of wild birds in Cuba is vital to conservation at a global level.

Since pre-Hispanic times, the people of Cuba have kept birds in captivity to hear their varied and melodious songs and to admire their incredible colors. Additionally such birds are of economic value, although in modern times it is illegal to sell certain birds or raise them for bird fighting activities. Both practices have contributed to the decline in populations of endemic and endangered species in the country. It is not unusual to see caged birds for sale at street and farmer markets, particularly the Cuban Grassquit (Tiaris canorus) endemic to Cuba; the Cuban Bullfinch (Melopyrrha nigra) endemic to the Caribbean islands; and the Painted Bunting (Passerina ciris), a migratory species whose population is in decline due to illegal hunting, and is considered under threat (IUCN Red List, 2014).

Courtesy of BIOECO

In 2010 in the city of Santiago de Cuba, the Eastern Center of Ecosystems and Biodiversity (BIOECO) organized a citizen science project focused on finding out the number of birds in captivity in the center of the city and on collecting information about the caged birds at homes. The goal of this project was to obtain information, which would help with local bird conservation efforts in the city. Coordinators, educators, and high school students conducted surveys in 133 houses in the center of the city for three consecutive weekends. They found that 8.3 percent of the households surveyed had a total of 37 captive birds belonging to 12 bird species. Under the

supervision of teachers and coordinators, youth obtained, analyzed, and presented the results to their parents, teachers, and school friends. Additionally, during meetings with respondents, several of the young people took the opportunity

to talk about birds, environmental issues, and conservation. We chose the Cuban Grassquit and the Yellow-faced Grassquit, as examples of what was learned during the surveys, from the experiences shared by the respondents.

During courtship and reproduction, Grassquits establish a strong bond in which the males become extremely jealous and fight each other for territory. Poachers who hunt birds and sell them, or use them in the illegal bird fight business prize this trait (Cosano, 2013), as documented previously by ornithologists, educators, journalists, and activists. This time it was documented in the city of Santiago de Cuba during the counting of birds in captivity.

Sharing and exchanging information with the community allowed youth and adults, who participated in this bird citizen science project, to become environmental educators in their own community. Surveyors and respondents learned about birds, their natural and captive environments, reasons why respondents liked to keep birds in captivity, and why it is vital to keep birds free.

Courtesy of BIOECO

Although this study lasted only a few months, BIOECO gathered preliminary information that would help to develop a second, more in-depth study. This project showed that environmental education projects for the conservation of birds in places where people tend to have birds in captivity may be a challenge, but may also be an opportunity for environmental education. In this case, participants explained to the community that it is healthier and economically more effective to enjoy the birds in their natural setting, and that it is unethical to keep a bird captive to enjoy its beauty or singing. It was an opportunity to sensitize people and talk about the economic benefits of bird-watching tourism, and how bird watching may contribute to people's health and promote bird conservation.

Experiences in Mexico: Green Jay Mayan Birding

The club of birdwatchers Green Jay Mayan Birding began with only two people. However, it is constantly growing, and more people join its birdwatching walks in Mexico. Juan and Cecilia were neither biologists nor ornithologists. Juan worked in a telecommunications company, and Cecilia was dedicated to sales and volunteerism. But birds changed their lives. When they married and bought a house, their new home was surrounded by trees. One day, birds appeared at their window. They were beautiful and the couple was surprised by their metallic green colors. They wanted to know what kind of birds they were. That's how their bird story began.

Courtesy of Green Jay Mayan Birding Club

Courtesy of Green Jay Mayan Birding Club

Now the couple can easily recognize these birds, the green jays (Cyanocorax yncas), resident birds widely found in Mexico. Curiosity led them to search for information on the Internet and at a library, and then to buy their first guide to birds of the Yucatan Peninsula. They wanted to know what these beautiful birds were called. Mexico has 1,100-recorded species of birds, with 565 of them in the Yucatan Peninsula, so this was no easy task. They had much to learn.

They bought a camera to take pictures of the birds sighted and shared the photos with friends. The couple began traveling throughout the Peninsula in search of more birds, learning about different species and studying their habitats. Their passion grew; they participated in festivals and won photo contests and finally they decided to form their own birdwatchers club, Green Jay Mayan Birding. The birds

became an important means to create environmental awareness and to spread the knowledge about the enormous ornithological wealth of the Yucatan Peninsula.

The couple faced two primary obstacles to their work: a lack of equipment and language difficulties—in some villages the people spoke only Mayan. Friends began to donate binoculars and others helped with translations from Mayan to Spanish. Today, both are tourism guides focused on birds and nature, and are part of the Network of Community Monitors Mayan Jays formed by members of bird watching clubs of the Yucatan Peninsula.

Courtesy of Green Jay Mayan Birding Club

In 2012, there were only two birding clubs in the Yucatan Peninsula. By 2016, there were 17. These clubs introduce people to birding and teach them about environmental issues within their communities. Participants share their bird observations through the citizen science platform aVerAves (http://www.averaves.org), the Mexican version of eBird (http://ebird.org) and a direct collaboration with the global scientific community. Until 2012, tourists or non-Mexican residents in the country made 90 percent of the Yucatan Peninsula bird reports in aVerAves. By 2014, the percentage of Mexicans reporting birds had increased 20 percent, reflecting a growing interest in birding in the region.

In addition to using birding as a means for environmental education in communities, birding can be promoted as a sustainable activity that benefits everyone and can be a significant economic asset to the countries that promote and create the conditions for it. Birding generates more revenue than golf and fishing in the United States (Cantú et al., 2011).

Additionally, residents who are bird literate can be trained as bird tourism guides, helping people to find local jobs and stay in their communities. Knowledge of local birds also promotes a better understanding of how native plants help resident and migratory birds, which can lead to bird-friendly reforestation and agricultural practices. These practices can provide the community with direct economic benefits.

Birdwatching clubs also organize regional birdwatching tours, in which club participants and their guests meet somewhere on the Yucatan Peninsula to socialize and, of course, watch birds. These local regional trips carry a message of conservation. These Mexican bird clubs are non-profit, cooperative organizations, and some participants voluntarily assist others who do not have enough financial resources to participate in the clubs' activities. The bird watching club participants seek out affordable prices, traveling in groups and sharing rooms and trip expenses. Club members hope that economic gains are enjoyed by the local communities they visit, and that the local community members have the opportunity to sell food, lodging, and products or services to the attendees. The goal of regional trips is to make the experience affordable so that many people can participate and enjoy birdwatching. Biologists, housewives, lawyers, children, doctors, people of Mayan communities, researchers, artists, photographers, young adults, developers, conservationists, writers, students, and elderly people are just some of the people who participate in these trips. All come together for a cause, "the birds."

The Mexican Bird Museum

Urban areas have large concentrations of people and numerous social and commercial distractions. As a result people tend to be desensitized to nature and may lack an appreciation of wildlife. Birdwatching can provide an antidote to this (Del Olmo, 2009).

Located in Northeastern Mexico, in the city of Saltillo, Coahuila, the Mexican Bird Museum (MAM) offers a window into nature. For 20 years, the MAM has provided an important contribution to environmental education by stimulating cu-

riosity about, interest in, and research on birds for children and adults, reaching out to people of all socio-economic classes. The museum's environmental education program, Birds of My City, uses birding to supplement the message, "Know to Value and Preserve." With its abundant and diverse bird populations, Mexico is the perfect place to share the value of birding and the importance of environmental education for conserving bird habitats. MAM seeks to extend that knowledge to the general public.

Because of the expense and difficulty of obtaining resources for watching and studying birds, the museum partnered with Optics for the Tropics and Birders Exchange, which both generously donated optical equipment. Such organizations often donate bird guides and new or used binoculars, in exchange for information and reports of bird activities in the area where the equipment is used.

Once binoculars were obtained, the MAM team printed support materials consisting of small bird identification guides of the most common species in the city, materials that explained the Birds of My City program and answers to common questions. Twice a week volunteer guides, social services personnel, and MAM's educators went to public places such as the Alameda and the Lake of the Ciudad Deportiva in Saltillo, Coahuila. In both locations MAM had bird stands, where participants were provided with binoculars, and taught how to use them. Experienced MAM personnel provided information and guided short birding walks as well as basic tips about bird watching, like how to recognize identifying bird characteristics, such as color, size, bill shape, wing and tail marks, behaviors, and songs. Bird guides also provided information about birds' residencies status and importance in nature.

Birding activities were well received by the participants. A significant result of these activities was the founding of the Birding Club of Saltillo, which operates under the auspices of MAM personnel. Subsequently, the program was also ex-

tended to primary schools, where students and teachers received the program enthusiastically.

Conclusion

Birdwatching is an activity that can inspire us to protect and conserve nature because birds connect with humans through their songs, colors, and shapes. Birdwatching gives us the opportunity to work both in classrooms and in parks, gardens, and wild and urbanized areas where the interaction of birds with their environment allows learning to occur naturally and without pressure (Villaseñor-Gómez & Manzano, 2003). Knowledge about birds opens a world of intellectual and aesthetic enjoyment and provides lessons for environmental protection, but experts worry that the world of birds is diminishing. If there is any hope of reversing this trend, it lies in increasing the general public's interest in birds and conservation (Conway, 1990).

According to Laurie Bennett (2011), messages to try to save and protect biodiversity should focus on "love" and not on the "loss" of it. She finds that kind of messaging is more attractive to the public and can inspire in a positive way, encouraging people to take concrete actions. This is a more optimal approach than scaring people with the "loss" scenario, which can be frustrating if no positive action steps are provided. Understanding and conservation of nature are the best evidence that we can aspire to be part of the harmonious river of life and build geography of hope with the rest of nature. (Ezcurra, 2013).

CHAPTER 3

Urban Community Gardens and Latinos

Liz Swafford, Laurie Silvan and Ricardo Arana Camarena

Courtesy of Laurie Silvan

Gardening can benefit people of all ages since it's an enjoyable way to stay active, reduce stress, interact with nature, and learn about growing food. When gardens are cared for in community, they become more than a source of food--they become a gathering place, an outdoor classroom, a source of community pride, and a place for cultivating cultural understanding. In recent years, community gardens have gained in popularity, even in urban areas as vacant lots are reclaimed for use as a place to grow food (Joy, 2014). Latino communities have started gardens of their own with excellent results, in places as diverse and far-flung as Minnesota and Colorado in the United States and in Mexico City. This chapter offers a basic guide for establishing a community garden with examples of places that have already done so.

Community Garden Types, Management, and Maintenance

Community gardens can take different forms, which reflect the interests and local needs of a particular community. Some gardens may be for private use by a school or church, but others are open to local residents year round. Many gardens charge a fee to rent a plot where individuals can plant their own items, while others may have a collaborative approach where everyone helps with all the plantings. The diversity of community gardens is endless because they adapt to the unique cultural diversity, resources, and organizations of each community. Some gardens

may be orchards with fruit trees, while others may grow herbs and vegetables for daily use. Schools may have sensory gardens where the plants have strong odors or unique textures (Souter-Brown, 2015). A garden may have raised garden beds to accommodate wheelchairs or to allow seniors to bend over and kneel less while gardening.

Garden start-up plan

No matter which type of garden a community chooses, it needs to have a clear management plan to ensure continuous growth and success of a project managed by a group. The management plan identifies the goals of the garden, administrators of the project, expectations for those using the garden, sources for funding, types of tools that can be used, sources of water, times of year the garden will be accessible, and other details (Carroll, 2010). A school, for example, may have a group made up of teachers, who are responsible for the continual care and maintenance of the garden during the school year, but the school can also have a volunteer group of parents care for it during summer break (Morgante & Magini, 2005). A community center funding a community garden on its property may designate a staff member to be the liaison between the facility and residents using the garden area. A community garden can also be established by a group of neighbors who have access to a nearby plot of land, are self-organized under a chosen or shared leadership, and have a clear set of guidelines agreed upon by all.

Starting a garden doesn't need to be expensive; however, it does require planning, which should include the input of community members who would most likely be using the garden on a frequent basis (American Community Gardening Association, 2016). Each garden is unique and reflects the environment and people that are guiding its construction and maintenance. Those involved in the planning process need to identify a site, resources, possible sponsors and supporters; design a layout for the garden; and determine the rules that should be followed by participants (Sharp & Rufus, 2013). Those planning a garden should consider a variety of options including a garden area just for children or the addition of educa-

tional signage describing the variety of plants species and uses. Participants of a community garden may also find it beneficial and rewarding to find a structured way to share experiences, enjoy learning and building friendships with other gardeners, and even be involved in other local community gardens.

Ongoing management

Once a site for a community garden is selected participants can decide how they want to garden. The amount of management funding available and the number of participants and time they can dedicate to gardening will determine what plants and gardening methods need to be implemented. For example, those interested in growing the healthiest foods may require the use of organic seeds and chemical-free pest control, which may cost more. This method, called "organic gardening," is highly recommended, since it addresses issues such as soil fertility, nutrients, and community health. If a potential garden site is small, a method known as "biointensive" gardening offers solutions for maintaining the fertility of the soil and providing maximum yield of crops (Jeavons, 2012; Bartholomew, 2005). Developers of community gardening projects should also consider inviting experts from the area to recommend the best uses and methods for a particular location, and take into account methods and techniques suggested by their participants, who may have different experiences and gardening knowledge to share with others.

Latino Participation in Community Gardens: Lessons from Successful Experiences

Courtesy of Laurie Silvan

Latino communities are benefiting greatly from gardens in their neighborhoods, schools, churches, or other gathering places as noted in the following examples from established community gardens. Gardens are a place to come together, get to know your neighbors, and work toward common goals. Participants, for example, may grow ethnic foods and herbs

that can be used as ingredients in making traditional foods for a cultural festival, which is a fantastic way for sharing cultural knowledge and traditions because everyone has a chance to contribute. For example, after a generous chili harvest produced at a garden on the outskirts of Tecate, Mexico, a group of American volunteers who traveled periodically to join in the gardening activities, were invited by the host community to share a traditional Christmas meal featuring chili beef tamales, where they learned about other cultural customs as well (Silvan, 2009).

Churches may be interested in growing food to donate to needy individuals as part of their outreach ministries. The community garden initiated by Vineyard Church of the Rockies, for instance, helps provide healthy food to at-risk and low-income families in Fort Collins, Colorado. Volunteers from the church and partner organizations maintain the garden. Since the onset of the project in 2011, the church has donated almost 1,000 pounds of fresh produce to an estimated 200 to 300 low-income families. Most of the volunteers had no experience with gardening before they participated in the project, only faith that they could make a difference in service to families in need. In addition, gardens may provide parents with practical ways to apply science teachings at home by talking about and utilizing what is available in the gardens, (Knable, 2011). At a community garden in the Bernal Heights neighborhood of San Francisco, many families were frequently seen in the gardens, and on at least one occasion, a journalist talked with parents who said their children enjoyed eating the vegetables they planted and picked themselves.

Gardening also offers a great venue for occupational therapy for seniors or those with disabilities. For example a garden was established and is tended by residents in a retirement community in Mexico City known as La Casa del Adulto Mayor de la Unidad. Bertha Leon, a 69-year-old resident, said, “Before we had the garden, I mostly spent my time indoors, alone, doing housework. Now, the gardening activities allow me to give more of myself to others” (Miranda, 2014). Only two months after the garden was established, which Bertha and 25 other

neighbors care for with pride, it starting producing strawberries, tomatoes, lettuce, broccoli, cauliflower, and baby carrots.

Bridging cultural gaps

Most importantly, a community garden can be a way to bridge cultural gaps within a community and encourage interaction among people who may not normally speak to each other in public spaces. For example, a community garden, hosted by the First Baptist Church in Long Prairie, Minnesota, purposely mixed Anglo and Hispanic plot renters to encourage interaction. Lyle Danielson, the CEO and president of the Latino Economic Development Center, started the project to provide technical and business training as well as small loans to Latinos to access land. The idea was that participants could apply their cultural knowledge about the plants they were growing, and share this knowledge with other members of the community garden. The goal was to help participants to gain skills and confidence about their knowledge to become successful farmers. These individuals had no access to land or farming skills when they began the program. Access to land for this Latino community was resolved by taking advantage of the community garden behind the local neighborhood church, which had 100 individual plots that could be rented. Aside from the program´s economic potential for the participants by providing them with new skills, Danielson saw this as an opportunity to address the tensions and barriers between members of the community.

In Mexico, there are many community-oriented, self-reliance food projects that commonly start as community gardens. Two are located in very contrasting places and environments. One is in the rain forest of Coatepec, Veracruz, where the Sustainable Gardens Network (Red de Huertos Sustentables), is focused on the efforts of a new generation of young agronomists and biologists seeking to educate

Courtesy of Laurie Silvan

children and adults about organic vegetable production and sustainable living practices. Additionally, they join forces to sell their produce at local farmers' markets and other solidarity economy networks.

The other network, with very similar goals, lies in the southernmost edge of the Baja California Peninsula, in La Paz. Here, Raíz de Fondo, a nonprofit organization in Baja California Sur helps three community gardens that were built on previously idle land (lotes baldíos). The facilitators of these garden projects have been teaching local "paceño" people how to sow their crops again during the less hot seasons in the otherwise extreme Vizcaíno Desert climate.

Another interesting example of a less structured network, but with a regional reach, is the urban gardening movement in Northern Baja California. There Transition Towns groups have been working for the past five years to recreate the back-patio vegetable gardening culture that used to be part of all Mexican family life, but that has been almost eradicated by mid-20th century modern practices. This unique population, comprised of Mexicans who come from every corner of the country, is rich in gardening practices and food cultures that include heirloom varieties. This area is being revamped and reorganized by activists, environmental educators, and community members to develop support networks of domestic, public, and private gardens, plots, ranchos, and entrepreneurial projects in Mexicali, Tecate, Tijuana, Rosarito, and Ensenada. This wide range of programs includes many community gardens. Good examples of feasible and community-oriented projects would be Refugio de Amor`s vermicomposting and solar cooking facility, which are run by mentally ill patients, and the Transition Tijuana`s Border Farms, which is a gardening self- employment project for deportees and the homeless (Nasser, 2015).

The previous examples show how community gardens can help foster a sense of kinship across cultures, genders, and generations, and in some cases cultivate new livelihoods. Neighborhoods, communities, and regions can establish gardens

for a variety of reasons, which can lead to a stronger individual, community, and environmental health. Potential planners just need to take the time to plan and envision what a particular garden should be like. A clear vision for a garden will aid in gaining the support needed to make it successful for years to come. While on the surface, it might seem that a group of people is just growing vegetables; the gardening experience is also transforming the community in a variety of ways depending on the goals and vision of the participants.

Conclusion

Community gardens can have any forms and may be developed through various approaches that not only provide sustenance for communities, but also bring communities together. As we have seen from the examples just provided, gardening initiatives cross borders and cultures. The community garden movement is taking root in the United States and flourishing in Latino communities, too.

Community gardens serve as gathering places and develop consciousness about the benefits of working together to reach a goal. But just as importantly, they provide a way to offer environmental education to community members in a way that crosses age, gender and economic boundaries. In a community garden, participants can become environmentally and ecologically aware in the process of gardening. The community garden movement is growing throughout the United States and Latin America, and we expect the movement to continue to flourish in the years to come.

CHAPTER 4

Winged Museum: A Traveling Museum

Samuel Lopez de Aquino and Gabriela Margarita Garcia-Deras

Introduction

According to the International Council of Museums a museum is a nonprofit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment (ICOM, 2014). The natural history museums, for example the Museo de las Aves de México (Mexican Bird Museum), provide increased awareness about biodiversity and its loss, evolution, pollution, conservation of natural resources, and additional topics that affect humans and other life forms on Earth. Through exhibitions and activities, museums mediate between science and the public, establishing a connection that most scientists and researchers do not have. Unfortunately, these museums are often located in big cities so not everyone has the opportunity to visit, acquire knowledge, and enjoy the recreational aspects that a museum can provide. One way to expand the audience for museums is to encourage traveling exhibitions.

A brief history

Would you believe that a war led to the origin of the traveling exhibitions? Following World War II, the cultural exchange between nations was strongly encouraged and traveling exhibitions were developed. Such exhibitions are popular because the visual representation in a traveling exhibition offers an intercultural form of communication in which language barriers begin to disappear (Osborn, 1963).

Information can be presented visually so that common problems and issues can be examined and culture and history can be exchanged and gain wider public recognition (Osborn, 1963).

According to the Cultural Information System (SIC, in Spanish) from the National Council of Arts and Culture (CONACULTA), in Mexico there are 1,185 museums of which 133 offer exhibitions that show the scientific advances in various areas of knowledge, including natural history, human history, and technology. For example, in 1996, Mexico City's Papalote Children's Museum created a mobile museum, which toured cities across the country to bring knowledge and fun to children. This gave rise to other initiatives, a few of which follow (Ibarra Lopez, 2006).

• In 2008, science communicators in Baja California created the Mobile Marine Museum to bring marine science traveling exhibits to public, cultural, and recreational spaces during large public events, as well as to educational institutions and public buildings. The Cultural Program of La Paz, the government of the state of Baja California, and the National Fund for Arts and Culture supported this project (Juarez Olvera et al., 2011).

• In 2011, the Ministry of Education and Urban Development and Environment in Tamaulipas, created a Mobile Museum of Turtles that seeks to show children and the general public the importance of conserving and protecting the species of sea turtles that nest on the coasts of Tamaulipas.

• In the state of Coahuila, a mobile museum, Omnibus of Science, was created in 2006 in collaboration with the state government, CONACyT (National Council of Science and Technology) and the Pedagogical University. The project was designed as a traveling science museum that goes from place to place in a reconditioned bus adapted to display different exhibits for children inside and outside of

the vehicle. The project seeks to raise the quality of science education by awakening and stimulating curiosity in communities wherever it goes.

An original idea?

Although the idea of a mobile museum is not novel, it is becoming increasingly important for outreach to isolated communities. Historically museums have focused on enhancing and preserving static collections. Fortunately, this situation is slowly beginning to change. Strategies range from improvements in public relations (e.g., flashy advertisements and billboards) to taking exhibits outside traditional venues to public spaces, where community participation can be encouraged (Rosas, 2006).

Courtesy of Museo de las Aves de Mexico

Courtesy of Museo de las Aves de Mexico

The Mexican Bird Museum in Coahuila is an example of a unique collection that is exclusively made up of specimens of birds. This traveling exhibit exposes people to the beauty and importance of birds in nature. This initiative has been exemplary and successful, and the museum has gained increased recognition for its valuable role as a promoter of culture and nature. Traveling museums are a response to a need in environmental education, which is to move educational materials and activities from schools and museums in large cities to more remote and rural areas. These informal educational spaces reach the most remote sites in Coahuila, allowing the public to experience environmental learning and activities, which can be transformative and educationally stimulating for individuals, families, and communities. In the Traveling Museum of the Mexican Bird Museum, participants can watch videos about bird natural history and the history of the Mexican Bird Mu-

seum; children can color bird sketches; and participants can learn about bird watching, and participating in bird citizen science to share their bird observations. Through these activities and bird watching, a connection with nature is formed. Additionally, the cultural backgrounds of visitors and their relationships with birds enrich the collective experience.

Birds were the ideal subject for crafting a message to the general public about the wonders of nature (Sada et al., 1995; Bird Education Network, 2014) The mobile exhibit is designed to travel to remote places to make residents, children and adult aware of the importance of birds in nature and how to preserve and protect habitats where they thrive.

Opening the wings

The development of the Winged Museum initially faced several challenges. The first was selecting topics that would be of interest to all kinds of people of all ages. The final decision was to address the various types of habitats in the state. A dynamic and attractive presentation containing basic information to show the wonders of birds was also developed. The selection of bird specimens was challenging: in the end a decision was made to select birds that would represent the intent of the exhibit and the biodiversity of the area, as well as select specimens that were appropriate for the discussion of conservation practices. In Mexico there was no precedent for a traveling exhibit of this nature. So, additionally, the design team had to develop a way to display the bird specimens and ensure that no specimen would be damaged. The display cases had to be durable and easy to assemble. Eventually, 10 wood and glass display cases were manufactured with four wood boxes in which the birds could be safely mounted and transported.

Courtesy of Museo de las Aves de Mexico

The original idea was to have a truck in which the cases would be displayed. However, as the project progressed, the team realized that the best solution was to use the truck only to transfer the bird collection and cases, and to use public spaces in cities or communities for the display. This turned out be an appropriate decision because it allowed for modular showcases that can be displayed independently or together depending on the available space, which provides a novel exhibit for each locality. An essential part of this initiative was the training of a museum staff person to travel with the exhibit to each location. This person provides tours and workshops to disseminate entertaining and educational information about the birds displayed to visitors in the exhibit. The project team has sought strategic alliances that will drive and maintain the Winged Museum so people in various areas will gradually and constantly receive information about the birds of Coahuila and Mexico. We received enthusiastic support from the state government of Coahuila and the state Ministry of Education and Culture, which allowed students to attend the Winged Museum exhibit, when it visited the different municipalities in Coahuila.

Courtesy of Museo de las Aves de Mexico

Taking flight

A visit to a municipality can range from 15 days to a month. Admission to Winged Museum is free and is set up in public spaces such as libraries, cultural centers, and auditoriums. Children, young people and adults enjoy a guided introduction to national and regional avifauna and the chance to participate in an educational workshop. With the help of a television, the exhibit also shows videos and movies about various bird-related topics. The intent is to motivate visitors to acquire a sense of social responsibility that leads them to take action in favor of the conservation of natural resources, particularly of birds and their habitats (see

photo 4). Since inception, the exhibition has incorporated additional activities and topics, for example, about migratory and urban birds.

Courtesy of Museo de las Aves de Mexico

Part of the success of this project is due to partnerships with international organizations. For example, teaching materials about migratory birds were received from Environment for the Americas (EFTA, http://www.birdday.org) that are shared with visitors. Support and bilingual printed material was also received from Celebrate Urban Birds, a citizen science project at the Cornell Lab of Ornithology (http://celebrateurbanbirds.org). Birding activities were also incorporated through the use of binoculars provided to visitors. Such optical material was obtained thanks to a donation from Optics for the Tropics (http://www.opticsforthetropics.org), which supports the project as a way to teach people to observe birds.

Courtesy of Museo de las Aves de Mexico

Where are we going?

As environmental problems worsen, the need to look for alternatives that can help diminish the effects of human impact on nature increases (Morales, 2014). When children and youth receive a broad education that includes information about environmental issues, their chances of finding work, staying healthy, and participating fully in society also increase. In a few words, education transforms (UNESCO, 2013). Environmental educators and communities are in unique positions to inspire and empower environmental "champions" (Cousteau, 2014). Educational content in today's society requires sharing the importance of caring for nature. For seven years, the Winged Museum

has been an extraordinary, rich experience full of satisfaction and learning. When present and future generations are educated about the conservation and sustainable management of resources, they become aware that all human beings can enjoy tangible benefits and improved quality of life. Introducing people to the world of birds and providing more detailed information, helps to create a stronger culture of conservation.

Since 2008, the Winged Museum has reached many communities and individuals. Records indicate that at the time of this writing, this wonderful world of birds exhibit has been seen by at least 102,000 visitors in Coahuila. This task has not been easy given the size of the state, which has the third largest land area in Mexico at 58,530 square miles (151, 563 square kilometers) and a population of about 2.75 million people. The Winged Museum project is a demonstration of how the dissemination of knowledge for educational purposes in any field can be effectively accompanied by exhibits (Osborn, 1963). Providing printed materials--either in Spanish or bilingual--to help reinforce the exhibit goals and topics is essential to helping people understand, retain, and share the information they learn.

Courtesy of Museo de las Aves de Mexico

The next step for the Winged Museum is to take the exhibit around the country. The experiences of sharing this exhibit throughout Coahuila make it evident that environmental learning in this way is successful and beneficial to the participants. Such programs allow museums to expand their influence beyond static locations, and to positively impact society by bringing educational opportunities to the people where they live, for those who otherwise might not be able to participate due to logistics or economics. Programs such as traveling museums have great po-

tential for transmitting information and knowledge and also for creating an awareness and connection to nature.

Acknowledgments

We want to thank the Board of the Mexican Bird Museum for all the support given to the mobile museum program, especially to Mr. Aldegundo Garza de León, president and founder of the Mexican Bird Museum. We also want to thank the government of the state of Coahuila and the Ministry of Education for the support of our visits to every municipality of Coahuila. And finally we want to thank everyone who helped make this dream come true.

CHAPTER 5

Nuestra vida: Significant Life Experiences in Latino Environmental Education

Sarah Naiman

Introduction

Significant experiences are events that have an impact on one's identity. Experiences at an early age are known to put individuals on a particular life trajectory (Wells & Lekies, 2006). The authors note that this trajectory does not change until another significant life experience, or a turning point, occurs: "Early experiences can set a person on a particular trajectory toward an outcome, which will persist unless a turning point occurs, resulting in a shift to a different trajectory" (Wells & Lekies, 2006). In the environmental field, researchers have explored the types of significant life experiences that can set individuals on an environmental pathway. These experiences have been identified within the general population, but they also apply to individuals from communities of color, including Latinos. In this chapter, I use interviews, case studies, and literature to discuss the three most significant life experiences that can influence pro-environmental behavior, illustrate how these significant life experiences apply to Latinos, and identify barriers to fostering significant life experiences in environmental education within these communities.

Since the 1980s, researchers have been investigating the sources of "environmental sensitivity." This is the "predisposition to take an interest in learning about the environment, feeling concern for it, and acting to conserve it on the basis of formative experiences" (Chawla, 1998). Environmental education can aid in the development of early environmental experiences or provide the turning point that changes individuals' views of the environment. Early experiences in green spaces,

the presence of role models, and exposure to local environmental problems are three significant life experiences that can impact an individual's environmental sensitivity (Chawla, 1998; Tanner, 1980; Wells & Lekies, 2006).

Although, the research conducted by Chawla, Tanner, and Wells and Lekies focused predominantly on Anglo participants, it is likely that these significant life experiences also apply to Latinos. In 2014, I interviewed 12 individuals who self-identified as Latino and participated in environmental projects and organizations in the Chicagoland area to identify motivations, barriers, and perceptions of Latino participation in relation to the mainstream environmental movement. The findings show many of the participants' motivations could be recoded around significant life experiences. The emergent trends suggested that the three most impactful life experiences for Latinos were (1) experiences in green spaces, (2) a teacher or other role model from a class or internship, and (3) recognition of poor environmental quality in the local community. Therefore, three of the significant experiences identified by Chawla (1998), Wells and Lekies (2006), and Tanner (1980) impacted Latino environmental sensitivity and participation. These interviews show that there is some overlap in life experiences with the findings of other researchers, although they cannot be generalized to reflect the views of all Latinos or even those in major cities, due to the small sample size of the study. Further investigation of these types of experiences would be necessary to confirm this connection.

Interviewee Motivations: Connect to Local Youth and the Community

The interviewees spoke about what motivated their pro-environmental behavior. All of the participants described experiences in green space, recognition of poor environmental quality, or the influence of a role model, internship, or class as a motivation for their environmental interest. (Figure 1). Additionally, half of the interviewees identified more than one significant life experience as influential. These multiple life experiences often occurred in combination, such as an aca-

demic mentorship program that allowed students to test the soil of their neighborhood for contaminants.

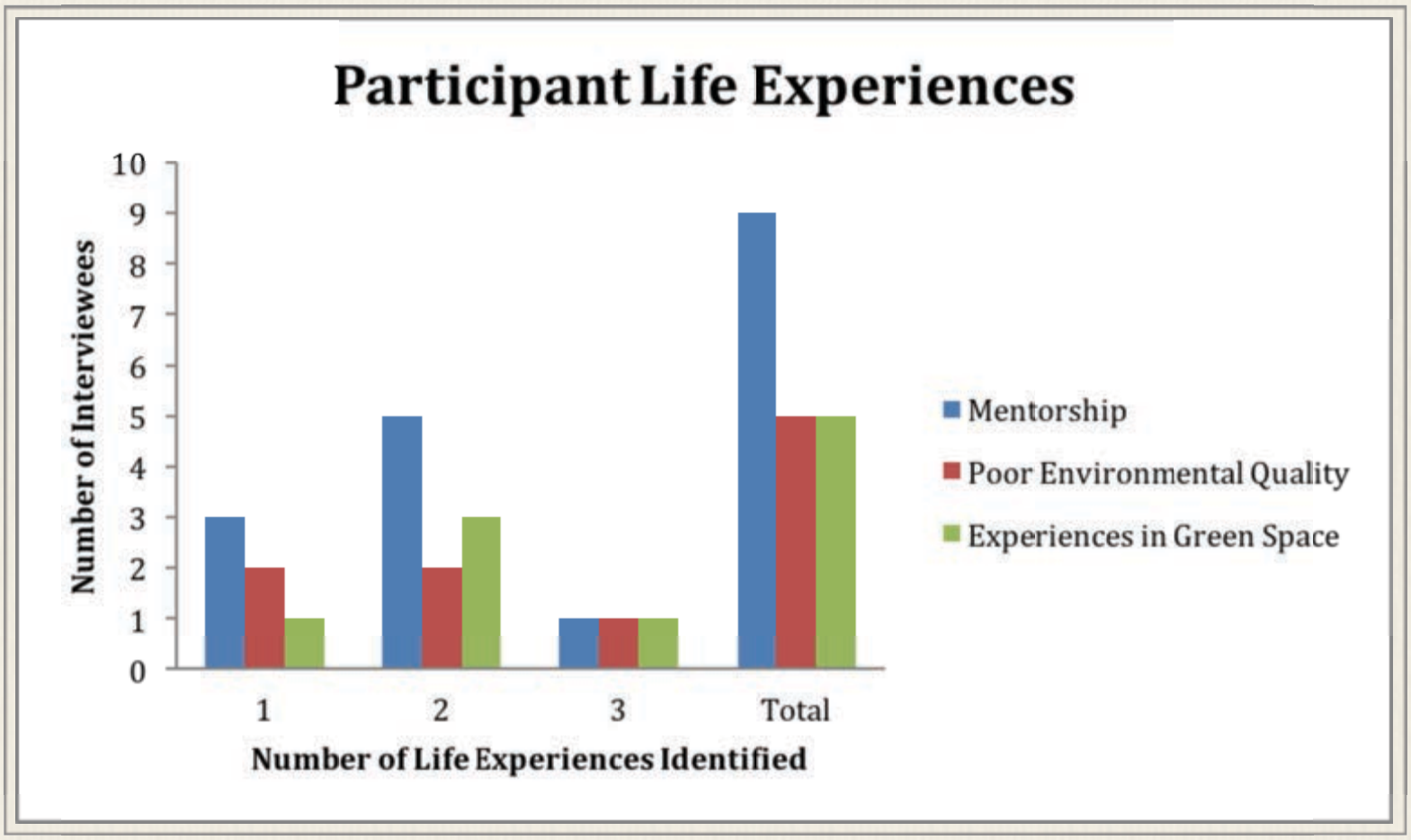

Figure 1. Participants' Motivations by Category

Mentorship

The most common experience to spark an interest in the environment was a mentor or the presence of a role model in an internship or class (Figure 1). Two participants described their high school experiences with a teacher.

"[Our teacher] would take us out there. This tiny little school in Southern New Mexico…would go picket in front of the landfill entrance with banners and stuff. He was awesome. And one thing that he always stressed and talked about was social justice…so I think that became a big part of how I saw environmental science and science in general."

"…in my AP Chemistry class…we tested the mercury and lead soil samples from the emission from the coal power plant…During high school it was mind blowing…and that's what inspired me to come into the science field…"

Based upon their own motivations and experiences, most of the interviewees placed great importance on the need for classes, internships, and volunteer opportunities for Latino youth. One interviewee stated,

"Sometimes people don't realize that they like doing something because they aren't exposed to it and they're not open to it. But you're not necessarily forcing them into it because they choose to be in an internship…they learn that they like it and that ends up being their career…"

Furthermore, they believed that early education is a key to environmental participation and further exploration of environmental problems. As the words of interviewees, "If the seed could be planted in the schools…then I think that would make a huge difference because kids are smart…"

"Youth are very important…if they have a view as young people, and follow through…then as an adult [they'll] be able to make those changes in society when [they're] at some type of position …"

The experiences of those interviewed and their recommendations about environmental education suggest that mentorship and environmental education programs for youth may positively influence their interest and concern for the environment.

Experiences in Green Space and Environmental Quality

Although poor environmental quality and a lack of exposure to green spaces were not as commonly mentioned as the need to spar environmental concern, these problems do reflect the importance of making environmental issues relevant to the local community (Figure 1). Five of the interviewees recalled how positive experiences in local green spaces promoted their pro-environmental behavior later in life. Here, for example, are two perspectives:

"For me…I've been in [the environmental field] since I was a young child. I started out with loving animals, and I think that every child has that love of animals. I just never outgrew it. It just kept getting stronger, so I majored in animal

science when I was in undergrad… now I help manage our volunteer stewardship program…"

"As a teenager I would to go to forest preserves a lot…I do remember them being cool places …so I just started walking around the preserves near my house. My girlfriend's father told me about restoration volunteer stuff that was happening and so I started going to some of those, and I just got hooked immediately."

Unfortunately, not everyone reported such positive experiences. An equal number of participants identified poor environmental quality in their community as a motivator to pursue environmental action.

"… [At the time I knew nothing at all about anything that has to do with the environment, pollution, contamination… [The pollution] was so bad that even if you didn't know anything about it, it just wasn't right. It was to an extent that it looked like a London fog every time you passed by it. It was like a cloud looming over [the metal manufacturing plant] and passing it out to the rest of the neighborhood."

"…At lunch time, people…would just throw away massive amounts of food… That's what really got me back then because I had seen first-hand, people starving and begging for food or just anything…. That's what got me interested in this [urban gardening] internship…[to find] the best way to acquire [food], the best way to grow it."

It did not matter whether an individual had positive experiences in green spaces or observed and recognized poor environmental quality in their community; both experiences influenced these individuals to pursue pro-environmental behavior later. The recognition of poor environmental quality directly connected larger environmental problems to the health and well-being of the community. By raising awareness about these problems, interviewees were exposed to environmental concepts and chose to participate in environmental work that directly addressed communal issues.

Connecting It Back: Overcoming Barriers to Environmental Education

While it is important to identify areas of focus for environmental education programs, interviewees also mentioned some obstacles to Latino environmental education. The two main barriers identified were the access to green spaces and the disconnection between environmental content and Latino audience. One interviewee mentioned difficulties in accessing natural spaces when trying to use interactive teaching methods in the Chicagoland area. While there are many forest preserves there, they are usually far away. "There's only a few that are actually in the city and not even all of those are accessible with public transportation," said one participant. Even green spaces are not often available or easily accessible. There may be only a single park in a neighborhood, or several brown fields and empty lots. Although transportation to a distant site might be provided if permission and funding can be obtained, a more effective approach would be to utilize the neighborhood itself as an education site. In doing so, individuals can learn that the neighborhood environment is also a part of nature. As stated by an interviewee, the environment includes "the air we breathe, the water we drink, the land we walk on… everywhere we live… and it all has an impact on our quality of life." This may change the perspective of learners who can then connect environmental issues to the quality of their lives in the places they call home.

The second barrier seen by interviewees was the lack of connection between larger environmental problems and individuals' lives. Environmental issues can be taught by relating larger problems to local concerns. As a participant noted, "… you should be invested in what's happening on your local level and see what's impacting your community…" Local issues should be at the forefront of environmental education programs, and then connected to the larger picture. For example if food access is a concern, a community garden may be instituted as a way to teach about soil pollution and soil quality, the importance of biodiversity, and composting. Similarly, a new local landfill or a tour of an existing one may help learners acknowledge the level of waste, which may lead to the creation of programs for reuse and recycling. These connections are more effective when environmental

educators utilize local environmental issues that are easy to see and impact the community's quality of life.

Although Latinos identified these challenges in the Chicagoland area, each community will face their own barriers to environmental education programs and participation. Once environmental educators identify the particular educational in the specific neighborhood in which they are working, they can create a plan that overcomes these barriers and connects environmental work with community issues and concerns.

Creating Life Experiences in Practice: Case Studies in Chicago

Two different groups in Chicago have attempted to provide at least two of the significant life experiences discussed in this chapter through the development of environmental programs. The Little Village Environmental Justice Organization (LVEJO) has succeeded in making all three significant life experiences available to members of the community. LVEJO has used the issue of poor air quality as a way of improving local understanding of environmental problems and efforts. In addition, they have increased both the number of green spaces and usage of them in their community through youth internship programs. In conjunction with other local environmental events, this program has helped generate local support for efforts to improve the community's quality of life. Another program, Wild Indigo has also focused on creating significant environmental experiences for minority communities. Although they do not deal with negative environmental issues, Wild Indigo has established local role models within the community to provide positive experiences in green spaces for not only youth, but for all generations.

Little Village Environmental Justice Organization

The Little Village Environmental Justice Organization (LVEJO) is one of the most successful local environmental groups in Chicago and has effectively tied local environmental quality concerns to larger environmental problems. The organization includes a collaborative program to address environmental justice concerns

of local youth and residents. Little Village is a predominantly industrial neighborhood on the near-south side of Chicago where residents are mostly of Mexican descent. In 1994, LVEJO was created by residents concerned about pollution near local schools and to help the neighborhood grapple with poverty, gang activity, and respiratory health issues. LVEJO uses these negative environmental issues to create awareness about these problems and to encourage community residents to seek remedies and solutions. Since its inception, LVEJO has continued to improve the natural, social, and economic well being of the community as a whole, while closely working with community members to determine local needs.

Photos courtesy of Sarah Naiman

One reason for the organization's success is its ability to connect larger environmental problems to needs of the community. For example, LVEJO members were driven to close several local coal power plants because of their impact on the air and soil quality in Little Village. This effort also aided in the local reduction of carbon emissions, contributing to the global efforts to reverse the planet's warming trend. LVEJO members have had similar success with other projects such as the redevelopment of brown fields, the creation of green space, and promotion of bike safety.

In addition to LVEJO's ability to connect local and large-scale environmental issues, the organization has also set up mentorships for community members, including youth. Through partnerships with the U.S. Environmental Protection Agency and the Field Museum, these youth learn about environmental issues and actively work towards implementing solutions for the future. The youth then share the information learned and make interactive presentations to the community to propose solutions. These events can range from high school science days to an

end-of-the-summer event that incorporates activities such as salsa contests, live music, games, presentations, and food.

Wild Indigo

Wild Indigo is a program created to increase citizens' exposure to green space and to provide community role models, who are knowledgeable about the local environment, to underserved communities in Chicago. The program was created through collaboration between the Audubon Chicago Region and the Forest Preserve of Cook County. Wild Indigo employs individuals from underserved communities to lead field trips to natural areas to explore and learn about native species and to promote accessibility to outdoor conservation projects. These employees are representative of different age groups and become role models. By the end of 2014, the program had been implemented in a predominantly African-American neighborhood in Chicago's Calumet Region, and plans were in process to expand the program to the Latino community of Pilsner in Chicago.

Photo courtesy of Sarah Naiman

Although the program successfully found people to become role models within the Calumet community, Wild Indigo must contend with the barriers of distance and accessibility to green spaces. The Chicago area has many forest and nature preserves, but they are scattered throughout the city and not always reachable via public transportation. The program provides transportation to and from the sites free of charge, but the travel experience reinforces the idea that nature is separate from the local community. This may make it difficult for participants to relate to larger environmental concerns of the neighborhood and may support the idea that nature is separate from the areas and communities in which people reside.

Conclusion

Early experiences in green spaces, the exposure to role models and to local environmental problems are three significant life experiences that promote pro-environmental behavior within the Latino community. These experiences highlight a focus on integrating local concerns of a community with the goals of the environmental education program. Incorporating all of these experiences into programs may not be optimal for all Latino communities. Every program will have its challenges; however, educators can identify the barriers and adjust education programs from community to community. This personalization is what will make environmental education programs more successful in the long run.

CHAPTER 6

Community Businesses Run by Families and their Role in Protecting the Environment

Rosalina Alvarado y Elizabeth Padilla

The family is a fundamental element of society and can be a driving force for building environmental awareness within urban and suburban settings (Palmer et al., 1999). In recent decades, the urban landscape and the family space have been limited by physical boundaries and a growing privatization of public space used by social organizations in their communities (Roitman, 2008). Given these limits, community members are increasingly seeking to acquire a fundamental role in the construction of cities and surrounding environments (Urban Land Institute, 2005). Residents are choosing to assert their needs and include their interests in the decision-making processes to improve urban environments and preserve the family unit within cities. (Roitman, 2008).

Learning about and caring for the environment is an important asset for families and extended families living in a community (Chawla, 2008; Palmer et al., 1999). An innovative way to promote sustainable communities is through the integration of families through local community enterprises (Vega & Santiago, 2013). Families have a great influence on the education of the community, especially on children. Research has shown that an interactive network of strong ties between parents, guardians, community members, peers and educators promotes learning and development, which can help form sustainable and safe environment for the families in the community (Chawla, 2008; Palmer et al., 1999).

At this point, it is relevant to point out, that the concept of family is a dynamic one and is constantly evolving. And although the most commonly used definition for family is a set of people with blood ties, today we recognize that family can be a group of people united by bonds determined by affection, by blood, by law, or other standards (Cabreira, 2015). Likewise, the community concept can refer to residents of a geographic area or a group of people with common interests such as farmers, fishermen, or artisans, among others, associated for a common purpose.

Like any business enterprise, a community enterprise is one that is organized to produce and sell products and services on the market. It has financial goals and also works to improve the socio-economic conditions of the community, including the creation of new economic opportunities, jobs and community investment strategies (Vega & Santiago, 2013). The community enterprises generally also take into account local environmental concerns.

The family is a powerful and valuable resource for transmitting environmental information and encouraging positive environmental behavior (Chawla, 2008; Palmer et al., 1999). In one study, the authors found that 33% of the participants considered the care of the environment to be important, and 46% of respondents considered looking after animals, plants, soil, and water to be an important part of their conservation actions (Rodriguez-Lepe, 2009). In addition, the authors noted that if parents or guardians express and serve as models for pro-environmental action and convey concerns and care towards environmental issues, their children are also more aware of their environment and prone to take environmental actions (Palmer et al., 1999). In addition, a community business with an awareness and connection to the local environment can help its families to improve their socio-economic conditions, and create programs to solve local environmental problems (Vega & Santiago, 2013).

In facing local environmental issues, community members may unite to solve problems that affect them directly (Chawla, 2008; Urban Land Institute, 2005). By

creating a company or organization, the "community "can obtain social and economic benefits through the generation of revenue and/or economic resources for its members, who in turn become educators of their own community (Vega & Santiago, 2013). This can lead to a sustainable community for the benefit of all.

Case Studies

The case studies presented in this chapter are examples of how families identify and solve environmental or economic problems through the creation of community companies. By creating a company, the families in the community become agents of change. The first example describes the family company Casa Pueblo, located in Adjuntas, Puerto Rico. In this case, two brothers founded a community company to protect hundreds of acres of forests, with efforts aimed at protecting the environment, providing environmental education, and selling sustainable products acquired from the protected forests (Casa Pueblo, 2016). The second example describes a family business, which makes use of forest resources to produce coffee. By being entrepreneurial, this family has found a way to use natural resources and enhanced agricultural practices to sustain themselves and the local forest through agriculture.

Casa Pueblo: A Community Self-Management Organization in Adjuntas, Puerto Rico

Casa Pueblo is a community self-management organization in Adjuntas, Puerto Rico. In 1980, the Massol-González and Deya-Díaz families created the organization, despite strong opposition from the government of Puerto Rico, which had plans to develop mining projects in the area. After years of struggle and uphill battles, Casa Pueblo succeeded in developing its project, Bosque del Pueblo, becoming the first community organization to manage a forest reserve in Puerto Rico. As part of the project, the forest Bosque La Olimpia provides water for more than 1.5 million residents from Adjuntas to San Juan, in Puerto Rico (Casa Pueblo, 2016).

Furthermore, this project also resulted in the Casa Pueblo Conservation Plan, which unites ten towns that are linked by the first biological corridor of Puerto Rico. This corridor connects five national forests. The project protects highly productive watersheds, ecological and sustainable agricultural areas, and controls urban expansion. The broad spectrum of sustainable and economic opportunities for the community in this project has been pivotal for the development of community self-management projects and campaigns that have proven beneficial for the region (Casa Pueblo, 2016). These successful businesses include Café Madre Isla (artisan coffee), a craft shop (Café Madre Isla, 2016), the ecotourism center Finca Madre Isla (Finca Madre Isla, 2016), and hydroponic agriculture. The project also contributes to the economy of Casa Pueblo and other initiatives, such as collecting membership fees and donations from visitors to the Bosque del Pueblo, La Olimpia Forest School, and the Village House. In 2002, the community was awarded the Goldman Environmental Prize, which recognizes grassroots environmental efforts worldwide.

Coffee production in Puerto Rico: The enterprises of the Valldejuly Sastre and Melendez Mulero families

Despite an economic downturn in Puerto Rico in the last couple of decades, the Melendez-Mulero family acted on its dream to develop a piece of land to grow aromatic coffee. They founded Hacienda Tres Angeles on a 87-acre plantation in Portillo at Adjuntas. In less than two years, they built a prosperous coffee agro-business that exports quality products to elite markets in England (Harrods'), France, Italy, and the United States. It is also the first coffee operation to be certified for agro-tourism by the Puerto Rico Tourism Company. As a result, the family company has generated 100 direct and indirect jobs. In an interview, Melendez Mulero said,

"This is not a time of crisis, it is a time of opportunity. In addition to the satisfaction we have working the land, we have engaged our children and they are acquiring love for the land " (personal interview, 2014).

Conclusion

Family and community companies that develop business initiatives for the production of sustainable goods and/or services using environmentally friendly models can achieve both, economic success and protection of the environment. These companies generate economic opportunities for families and their communities, while conserving and protecting their surrounding natural areas for the future. Thus, a community business nourishes the desire of its members to share common goals and address collective needs by developing environmentally and financially sound strategies for a sustainable future.

CHAPTER 7

Informal Environmental Educators Teaching English Language Learners

Michelle Byron

Courtesy of Michelle Byron

It's sometimes tough for environmental educators to surmount language barriers. You are ready to start teaching, when you realize some students are native Spanish speakers with limited knowledge of English and unfortunately, you speak only English. What do you do? How do you teach the group so that everyone feels comfortable, participants and learners? I would like to share a few strategies that are easy to implement, foster better understanding in class and that support the range of learning styles of all students, including English language learners.

Background

It is important to remember the dual challenge English language learners face in the classroom. While English-speaking students are tasked solely with learning new academic content, English language learners are responsible for both learning a second language (English), and learning new academic content. The proper adjustment is to focus on the main concepts and processes of the lessons, breaking the content into small, manageable pieces that enables English language learners to participate (Carrier, 2005; Rohac, 2013; Medina and Sohn, 2013).

The general wisdom is that English language learners may be conversationally proficient in English after one to three years in school; but it takes five to seven years to acquire solid academic English (this includes reading, writing, speaking and listening in specialized content areas, like science and history). Furthermore, some English language learners struggle with higher-level language functions and sentence structures required in order to predict, analyze, justify, and explain events and concepts necessary for class (Carrier, 2005). In real life, this may equate to the English language learner not comprehending what the science teacher explained, because the scientific terms and vocabulary are unfamiliar. Even so, the student is still expected to read and study the material in the accompanying English language science textbook, as well as do homework and write answers to questions on a test in English. Because of the students' mastery of conversational English, as well as cultural expectations to respect, rather than "bother" teachers by asking questions, this struggle to absorb more abstract and complex material may not be properly identified and handled (Plastino, 2006; Verma et al., 2008).

As a teacher, one thing you can do is remember to speak slowly and clearly, pausing between phrases. Use short sentences and action verbs. Stop and ask if everyone knows the meaning of a word if it is not a common term. For example, when a second grade class was learning about earthworms, the word "damp" was used in a book I read aloud. After I read the sentence describing how worms need damp soil, I asked the class the meaning of the word. One student responded that it is when you put a towel on your wet hair. She had heard the word before, but did not understand the context relating to soil where worms live. I explained to the class that it meant "a little wet." Though it was not a difficult or very specialized scientific term, "damp" is not a word used frequently enough for these Spanish-speaking students to learn it from everyday conversations.

Courtesy of Michelle Byron

Program set up

There are many things to prepare before teaching a program. As you create your lesson plan and prepare activities, here are a few suggestions of things you can incorporate to make class time more productive for everyone.

- Label equipment in English and the students' native language, to provide a picture dictionary. This shows respect for the students' culture. It also teaches your native English speakers a few words in another language.

- To make it easier for English language learners to recognize, write the word in their native language first, and in English second.

- Modify the activity to be locally relevant (e.g., use commonly seen animals or neighborhood issues).

Many English language learners have difficulty reading in English; so choose a read-aloud story or video to get the class started (Medina and Sohn, 2013). In one of my first grade classes, as I read aloud a book about ladybugs, a boy drew a picture of me with a "laty bog." If I had written "ladybug" on the board, it would have used another form of communication; and seeing the word would have provided another way for students to process the information.

Courtesy of Michelle Byron

Creating and delivering a lesson

To build an effective environmental education program for English language learners, we must make the content and language of a program understandable, while providing a supportive learning environment so students feel comfortable and able to participate (Rohac, 2013). The sheltered instruction-teaching model meets both requirements. By adapting the lesson content, and using visuals aids, gestures and other illustrative resources, the content is presented in a way that "shelters" English language learners from linguistic demands (Arreguin-Anderson and

Garza, 2014). The key is to create inquiry-based lessons because they facilitate interaction, questions, and ways to demonstrate understanding, with less dependence on English language abilities (Pray and Monhardt, 2009). Communication and function are emphasized, rather than grammar and form (Hansen-Thomas, 2008).

Lesson preparation

The same norms can be applied to teaching environmental studies as to other academic subjects. First, create program objectives for the subject matter, linking them to state curriculum standards when possible. At the beginning of your program, inform everyone of the purpose. Write easy to understand objectives for students to see and read, and announce them orally to the class. This helps all students understand what will be important. By knowing the objectives, students may actively assess their progress. (Echevarria, et al., 2004; Verma et al., 2008; Hansen-Thomas, 2008; Pray and Monhardt, 2009; Bergman, 2013).

Building background

Build a bridge for your new material. Link new concepts to the students' home or family background, to units they learned in school, or to common knowledge (Hansen-Thomas, 2008; Verma et al., 2008; Pray and Monhardt, 2009; Medina and Sohn, 2013). Remember to modify the activity to be locally relevant (e.g., use commonly seen wildlife, rather than animals from other continents). By focusing on neighborhood quality of life issues, environmental education is more relevant to students (Sachstello-Sawyer and Fenyvesi, 2003; Medina and Sohn, 2013) and English language learners benefit from additional exposure and opportunities to practice speaking (Carrier 2005).

Common Knowledge in Practice

Courtesy of Michelle Byron

For example, my program about urban habitats and birds used the students' knowledge from an "urban/ rural" unit the class studied earlier that year. It was a great way to take what they learned a step further, to show that natural areas of the city provide habitats for animals, too. We focused on urban birds because they are everywhere and easy to see. A discussion of how people meet their needs for shelter and food used common knowledge and formed the bridge to connect to our investigation of where birds find shelter and food. The class also went on a field trip to a local park to observe habitats and birds.

Courtesy of Michelle Byron

Lesson Delivery- Classroom Management

It's worthwhile to implement a few management skills to support successful lesson delivery. Have routines. Before starting an activity, remind students of the lesson objectives, what they are expected to do, and where to find materials, so they are better prepared to participate (Echevarria et al., 2004; Verma et al., 2008; Pray and Monhardt, 2009; Bergman, 2013).

Lesson Delivery - Interactivity

Activities, songs and play help to build a large foundational vocabulary. English language learners may not realize that songs and games teach pronunciation, intonation, word structures and relationships. There are many songs out there, starting with the traditional folk song, "Old MacDonald Had a Farm or "Do You Know these Sounds" by Jeanne Nelson and Hector Marin that puts the sounds that animals make to music that can be used to enhance environmental

education. This develops literacy skills and leads to more proficient reading, writing, speaking, and listening. It also provides important opportunities to practice vocabulary orally. (Echevarria et al., 2004)

Comprehensible Input- Educator Behaviors

Repeat and review new words throughout the program, so students understand them and learn how to use them. For example, when we were doing the lesson discussing animal habitat, I defined "habitat" the first few times it was used. Then I used the vocabulary term, "habitat," in the remainder of the program. As I concluded the program, some students became familiar enough with the term to add it to their vocabulary, and use it in a sentence.

Total physical response uses movements to teach new vocabulary while using the words in an activity. Create hand gestures or signals to accompany terms as reinforcement. Repeat each word and movement before the activity so students recognize their meanings (Medina and Sohn, 2013). For example, in a class game about habitats and urban birds, rubbing your tummy was the hand gesture for food, and holding both hands over your head in a point like a roof was the gesture for shelter or home. By using strategies like gestures, demonstrations and modeling as well as visual aids and hands-on, experiential activities and demonstrations (Hansen-Thomas, 2008; Verma et al., 2008; Arreguin-Anderson and Garza, 2014) academic tasks are explained more clearly and with less reliance on verbal communication.

Courtesy of Michelle Byron

Interaction and Practice

English language learners may be more comfortable working collaboratively. Assisting each other may be expected and valued in their cultures, and not viewed as cheating (Sachstello-Sawyer and Fenyvesi, 2003). Working in small groups pro-

vides a great opportunity for students to practice language in a secure and comfortable setting among friends. Hands-on materials also help students to practice new content knowledge. For example, in the program about earthworms, all students were provided with a few worms to observe on their desks. They examined and touched them. The teacher did not just read a book to them; the students interacted with the worms. They discussed and compared their worms with students at nearby desks.

Review and Assessment

One tool is to employ group response techniques so that with a quick glance around the room, an educator will see how many students comprehend the material. This creates a learning environment in which all students participate equitably; and preference is not given to native English speakers, who often will answer first. Obtaining a group response from a class is simple. After an educator asks a question, all students raise their hands, holding up either one finger if they think they know the answer, or two fingers if they cannot answer.

The benefits to this strategy are immense. All students are engaged by responding; and the educator may immediately gauge whether the majority of students are ready to continue. Plus, it is a safe and nonthreatening way for students, particularly English language learners, to share whether they understand a concept, without receiving uncomfortable individual attention or being put in an embarrassing situation if called upon (Verma et al., 2008).

The end of a lesson or activity must include time for review. A post-activity discussion provides guidance for students to make connections between the lesson and real life, between science content and direct physical knowledge. Also, it provides opportunities for English language learners to revisit key vocabulary and concepts, and for educators to informally assess how well students retained the new information. Offer multiple ways for English language learners to demonstrate their

understanding, such as using oral language, demonstrations, or drawings, rather than detailed writing (Echevarria et al., 2004; Carrier, 2005; Verma et al., 2008; Bergman, 2013; Medina and Sohn, 2013).

Application of Strategies

Hands-on activities, visual clues, cooperative learning and guarded vocabulary are four sheltered instruction techniques that reflect best teaching practices (Echevarria et al., 2004; Hansen-Thomas, 2008; Rohac, 2013). The essence of the program is to provide context for language.

Courtesy of Michelle Byron

By starting a lesson with an activity, a reference point around which to build language is created. When engaged in a meaningful hands-on task, students more easily comprehend concepts, key language, and content vocabulary that the educator is conveying. Describing key words visually helps transform abstract concepts into concrete, accessible knowledge. This helps students who learn best by seeing something, rather than listening to an educator talk about it (lecture), or by reading it (Rohac 2013; Medina and Sohn, 2013). Working together reduces student stress, provides peer support, more opportunities to practice oral language skills, develop social skills, and exposes students to other points of view. It also enables students to communicate in their primary language. English language learners often feel more comfortable and secure sharing with someone from a similar background. To increase students' comprehension, it is important to speak more slowly, and to choose instructional vocabulary carefully, always being mindful of words or phrases students may not understand. Then ask carefully worded questions, and scaffold to incorporate additional vocabulary. This is called "guarded vocabulary." (Rohac, 2013).

Some common approaches to increasing student knowledge using the above four strategies are to integrate the use of pictures, manipulatives, models, demonstrations, movement, gestures, body language, drama, videos, multimedia, and experiential hands-on activities (Carrier, 2005; Rohac, 2013). Similarly, English language learners may be assessed without relying heavily on their ability to write with specialized vocabulary, by including tactics such as pictures and drawings, or assessing the performance of a real task (Carrier, 2005; Rohac, 2013; Medina and Sohn, 2013). For example, at the time of this writing, there was a lot of media coverage of coyotes living in New York City. When the class went on a field trip to Central Park, a group of students tried to scare each other with fake coyote howls and sightings as we walked through the park. I made this the focus of our unit. We pretended to be coyotes, learning how to survive in the park, where to find food, water and shelter. We learned about adaptations and using our senses in real life situations. In another activity, we acted out what happens when there is an abundance of food and growth in population.

Courtesy of Michelle Byron

This example above shows how I used many of these strategies in one lesson. Students were interested in coyotes. By creating a lesson to address their concerns, I focused on local wildlife, making our topic relevant and interesting. Rather than assigning reading to the students, we engaged in active outdoor activities to learn about coyote behavior. While I verbally described how to "be a coyote," I also physically demonstrated what to do. I cupped my hand behind my ear to make a large coyote ear, and I licked my finger to wet my nose, giving me a sharper sense of smell, like a coyote. If I had not used this additional mode of communication, directions to "cup your hand behind your ear" or to "wet your nose," might have confused students.

Students worked together in groups; and each group had a turn to sit in each sensory area. That way, everyone shared similar experiential activities from which to draw conclusions. At the end of class, we got together as one large group to compare our experiences. This review was important to confirm and summarize what we learned. In another activity, instead of reading the definition of the scientific term "carrying capacity," I talked about population growth and we acted out what happens to the number of coyotes able to survive when there is either abundance or a shortage of food. The students easily learned the concept, as they lived or died in the coyote survival game.

Courtesy of Michelle Byron

Possible obstacles

The teacher in a mixed classroom, that is a classroom with native English speakers and English language learners has to learn to strike the balance to keep all students engaged. The difficulty can be that native English speakers get bored, while English language learners may be left behind. One concern is the classroom teacher who speaks only English and does not understand what her student is trying to communicate. Using the sheltered techniques previously described is a help, but further research, especially in the field of environmental education to determine how well all students are being reached --be they native English speakers or English language learners -- may be warranted.

Another issue may come in the form of school administrators who are impatient or who fail to grasp the new classroom demands of teaching in multicultural and multilingual settings. During one experience I had at an elementary school in New York City, I shared my concerns with my supervisor regarding native Spanish speakers who are English language learners in my classes.

I do not speak Spanish and I shared my concern that some students did not seem to understand me. My supervisor advised me if the students could not grasp what I was saying, "do not worry about it; we did our job."

Finally, there are still those educators who do not understand how to work with English language learners and treat them as if they less capable they have not yet mastered English.

Creating watered down content or designing separate simple lessons for a lower grade level is not the answer for teaching English language learners. It is the educator's job to inspire, not to bore students and bring new English language speakers into the school fold.

Conclusion

Many informal environmental educators have little to no training for working with English language learners. In many areas, it is common for a class to include non-English speaking students; and the educator only speaks English. This is a significant problem for environmental educators because it limits students' understanding, and therefore the students' are unable to learn and engage in activities. By adapting the program to be more aware and thoughtful regarding methods of communication, it ensures everyone feels comfortable and is able to participate. With a few moderate adjustments so your lessons and presentations rely less on English vocabulary, all students, including English language learners, may succeed in your classes.

CHAPTER 8

Looking at the Community Through a Different Perspective: Community Diagnosis and Participatory Environmental Education with Youth from a Rural Community

Roberto Méndez

Introduction

Sixteen-year-old Luis lives in a rural community in the state of Hidalgo, Mexico. The landscape of this farm and cattle community is shaped by desert shrubs and temperate forests that show severe signs of degradation, including erosion, deforestation, and loss of useful local plants. As many young people his age do, Luis goes to school in the mornings, at the Telesecundaria, part of a system of distance education programs in Mexico available in rural areas for junior high school students, from 7th to 9th grade. In the afternoons he does house chores and reviews his school lessons either at home or at a "cybercafé" in his community. Despite living in a rural area, Luis is unfamiliar with many of the ecological processes, plants, and animals that have sustained communities in the region for generations. In part, this could be because his school does not offer students enough opportunities to get to know the natural environment. However, his parents may not want him to participate in farming activities such as sowing corn or gathering plants and edible insects because they hope Luis will have other opportunities. His parents, like many other adults in the community, expect their children to leave their communities to study and get formal employment that ensures a stable income. Work in the field is uncertain and difficult given the depletion of the soils, lack of rain, and limited economic value of farm products.

Courtesy of Roberto Méndez

Courtesy of Roberto Méndez

Educating young people about their environment assures the continuation of environmental knowledge, the strengthening of local culture, and the environmental restoration of degraded regions. In 2013, a team of professionals from "Centro CEMEX-Tecnológico de Monterrey para el Desarrollo de Comunidades Sostenibles" (CEMEX- Monterrey Tech Center for the Development of Sustainable Communities) implemented a participatory environmental education project in Luis' community. This project was driven by two main goals: working with communities to foster their participation in environmental activities and engaging youth in environmental learning processes so that they may know and value their particular community's natural wealth. In environmental education it is necessary to create spaces for dialogue with the communities, particularly with their youth, to talk about their issues, knowledge, vision, and traditions. With this in mind, a team of Environmental Promotores was created, formed by local students, including Luis, and a team of Environmental Leaders composed of Monterrey Tech students. These students, along with professionals and educators, prepared a community diagnosis about local environmental issues, shared the results with the community, and together planned and implemented activities to improve the local environment, such as planting a community garden.

Participatory environmental education is an approach to environmental education that acknowledges the specific social and cultural characteristics of participants; it fosters social learning and local participation; it values traditional natural resources management practices and facilitates research and local environmental action (Ardoin et al., 2013; Bermúdez-Guerrero et al., 2003; Paré & Lazos, 2003; Ruiz-Mallen et al., 2005).

Participatory Environmental Education and Community Diagnosis

The participatory environmental education approach represents the intersection of many sources and perspectives on education, social action, and natural resources management. This process engages communities in discussions about the social-ecological features of environmental realities (in other words, their cultural, economic, and historic dimensions) to incorporate citizen action and learning (Sauvé, 2005). To achieve this, participatory environmental education fosters processes for the co-construction of knowledge among external actors and local residents to identify environmental problems and collectively solve them. In contrast to traditional education, participatory environmental education considers people as active agents in the construction of environmental knowledge given their direct contact with environmental phenomena and the exchange with local and visiting experts. From this perspective, participatory environmental education must be contextualized to focus on issues related to local life, biodiversity, and history, in order to develop materials and content that reflect the ecological and social wealth of each particular scenario.

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Methodologically, the participatory environmental education approach is based on community diagnoses, defined as spaces for the collective construction of knowledge, reflection, and environmental planning. Community diagnoses programs are widely disseminated tools in the natural resources management sector, as well as in educational processes. In Mexico, one of the most disseminated approaches is the Rural Participatory Assessment (Evaluación Rural Participativa) (Zazueta & González, 1993), which includes a set of research and environmental monitoring tools, incorporating local and external actors. Along with this methodology, this project also integrated Hart´s initiative to mobilize youth by involving them in research activities such as mappings, mock-ups, and interviews. This allows youth to

look at their environment from a wider and more analytical perspective and to participate in actions to improve it (Hart, 1997).

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In this project, the diagnosis was aimed at engaging youth in researching the history of their community, its social organization for natural resource management, and its biodiversity and environmental problems. The diagnosis was one of the early phases of this participatory process, followed by delivering research results to the community, and planning and executing environmental activities (Esteva & Reyes, 1998).

Building a Team: Environmental Leaders and Promotores

Several projects in Mexico have shown the potential and the difficulties of youth participation in environmental studies in their communities. For example, young people in communities in Oaxaca and Michoacán demonstrated interest in participating in the environmental improvement and transformation of their forests, but they did not know the specific environmental problems, mainly because their school activities are disconnected from the productive activities of adults (Ruiz-Mallén & Barraza, 2006; Ruiz-Mallen et al., 2010). Other authors—such as Paré and Lazos (2003)—have found that power struggles within communities and the marginalization of young people result in a failure to incorporate all voices in the conservation of natural resources.

Those of us working in Mexico know that schools bring together the whole community because they are a meeting place for adults, children, and youth. Working with schools facilitates summoning and participation. When we were integrating the team of Environmental Promotores, we presented the project to authori-

ties of the local Telesecundaria and requested their backing. The director and teachers supported the formation of the first group of Environmental Promotores, comprising 16 students aged 12 to 16. Participants were selected by teachers and the school director based on very heterogeneous criteria: some were selected because of their good grades, others because of their people or leadership skills, others to motivate them to participate more at school. As mentioned previously, four undergraduate students from Monterrey Tech supported this team as "Environmental Leaders," facilitating some tasks and motivating the youngest ones to participate.

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Environmental Promotores and Leaders had several meetings to integrate as a team and learn about community diagnostic tools such as maps, vegetation transect, and interviews with important community actors; they trained to use cameras and they learned about other environmental projects, which motivated them to do their tasks. It was during these meetings that Luis and his peers learned about a methodology to look at their community with a different set of eyes; they also met the Environmental Leaders who shared their experiences about life in the city.

Let's Research! Community Diagnosis

To conduct the community diagnosis, the team of Environmental Promotores and Leaders looked into two main themes: social capital (community history, local organization, institutions and actors) and natural capital (biodiversity, locally-used natural resources, and environmental problems). The diagnosis tried to answer questions such as the following: What is the history of this community? What natural resources did the community have when it was founded? How have the landscape and natural resources changed? What natural resources are regularly used in the community? Who are the main actors in the community? What are the envi-

ronmental problems that most concern residents? And, finally, what activities does the community propose to start improving the local environment?

For three months, the Promotores met once or twice per week during the school day to work on the diagnosis. They interviewed local authorities, producers and elders, as well as other people who could give information about the community. They also went on field trips, and the most knowledgeable and experienced team members guided less skilled team members during outdoors activities. While out in areas of secondary vegetation, farmland, and rivers, students observed flora and fauna, and collected plants for a local herbarium.

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With the information they gathered, team members prepared a natural resources calendar, a map of key players in the community, as well as a community map that reflected the understanding the students have of their land and of their everyday spaces. This same map was used to visualize and plan some environmental tasks once the diagnosis was made. This diagnosis was a collective task that demanded a commitment and significant initiative from all participants. Environmental Leaders joined the Environmental Promotores during several activities; on other occasions, they were virtually present through emails.

Within the group, not all Promotores were equally involved with the project. Some were more active than others, and the older ones always wanted to have their voices heard. On the other hand, the younger ones were barely familiar with the school culture and sometimes found the work of reading and writing to be tiresome and boring. Because they are younger, they are also beginning readers and writers and may be more challenged by the materials.

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Efforts were made to use each participant's skills, as some were better at interviewing, others at guiding the group through the field and pointing out the names of plants and animals. Others preferred to be photographers, documenting the experience. As much as possible, each activity was used as an opportunity to value individual contributions and underscores the importance of knowing one's community.

After the Diagnosis: Posters and other Didactic Materials

The Environmental Leaders organized the diagnosis results into tables and summary cards. The Promotores reviewed this information, and, with the Environmental Leaders, decided to produce a series of themed posters (water, biodiversity, local plants, and local history) to share the first findings with the community. The group designed each poster (layout and contents), and delivered the printed posters to neighbors, in community meetings, and in schools. The group used these opportunities to talk to some of the neighbors to confirm information and learn about some of the environmental concerns people were willing to share.

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This new information provided a guide to produce a document summarizing the experience of almost one year of work: a booklet with the detailed results of the diagnosis. The booklet shows, for instance, that the community has a history of almost one hundred years, during which time community members have been able to strengthen their organization, although the landscape has changed dramatically. Among the most affected natural resources are creeks about to lose their fresh water reserves, eroded soil in farming and grazing areas, and the depletion

of maguey and other food plant populations. The booklet also included proposals by several neighbors to reduce the environmental impact in the community, such as planting a community garden with local plants, as well as cleaning and collecting trash on the streets. The implementation of these ideas will be negotiated with authorities, teachers, parents, and Environmental Promotores.

The process that started by integrating students and conducting the diagnosis of the local environmental situation, concluded with the development and distribution of these printed materials and planning of community activities. Returning the information to the community and closing the projects with planning activities are part of the methodological cycle of any participatory project. This reflects a commitment made with the people before starting a community project, which promises that the information generated will be used mainly for local purposes.

First Results, Challenges, and Lessons Learned

Eighteen months after starting the project, students from the Telesecundaria were surveyed to determine whether there were differences between the learning and motivation of Environmental Promotores and the other students. Open interviews were also conducted with teachers and four parents, and informal conversations were held with more than ten local adults. Unlike students who did not get involved, the Environmental Promotores could identify very specific environmental problems, such as the depletion of populations of local plant species, and they understood the importance of those resources for community culture. The Environmental Promotores showed more curiosity and more interest in engaging in activities in the field. Additionally, parents, teachers, and other local adults positively valued student participation in the project: they observed that the students developed socialization and teamwork skills, as well as self-confidence. Parents considered that participation in the project motivated Environmental Promotores to relate to other people and value their community.

There have been difficulties and changes in direction along the way. For some of the Promotores conducting diagnostic activities and reflecting on the information collected was not very appealing, and some even thought that it was boring. The students enjoyed being away from their school and engaging in activities outside of their school routine. However, whenever asked to do typical school tasks, such as writing or assessing information, their impatience was evident. In addition, some adults in the community were uninterested in offering information or sharing their knowledge during the interviews, which devalued the work of the Promotores. And finally, taking time from the school day to work on the diagnosis wasn't always easy in spite of the teachers' enthusiasm for the project; for example, ongoing exams and other previously scheduled school activities created conflicts for the students between their project activities and formal school demands.

All this required schedule adjustments, a reduction in the number of activities carried out during school time, and constant negotiation with teachers about the importance of integrating participants into extracurricular activities. Additionally, the diagnostic activities were alternated with more dynamic activities for the group, such as exploration hikes, video recordings, and collection of seeds from local plants, which were not included in the original program, but provided a nice break from what some students considered the more mundane activities.

The challenge after the diagnosis was generating agreements and engaging other sectors of the community beyond the school itself to implement and follow up on the community garden proposal and provide continuity for the waste collection activities. The process has continued to be difficult, because the community assumes that the project is the sole responsibility of the Telesecundaria given that the garden will directly benefit its students.

We learned from this experience that participatory methodologies require an environment that favors and values student participation in community research activities. When working from school, it is necessary to formalize participation agreements to ensure student participation throughout the process; incorporating the project into the school curricula can be a good alternative. Local adults also need to be familiar with the project's objectives, advantages, and limitations. Before starting a diagnosis, it is recommended that activities be conducted to familiarize participants with the participatory methodology and work models. This will help create a more favorable environment that fosters a clear understanding of the activities among participants.

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As a final observation, from the participatory environmental education perspective, this diagnosis activity is useful when initiating contact with a community for which there is no information and for which there is a need to build a knowledge base for an environmental education project. In such cases, the following steps can be helpful: (1) invest time and effort in training and motivating the group, (2) specify the topics of the diagnosis (the diagnosis itself can be more useful when topics are narrowly defined), (3) use tools and techniques appropriate to participants' ages and (4) involve more members of the community from the outset.

Luis, the youth we mentioned at the beginning, is about to graduate from Telesecundaria and start high school. Thanks to his two-year experience in this project, he now has an opinion about the environmental problems of his community and has a different perspective on his environment. Like his fellow project participants, he recognizes the names and uses of many local natural resources, he understands the importance of paying attention to the loss of maguey varieties and of other native plants, and he has had the opportunity to travel within his commu-

nity. He now talks more with his grandfather about local farming practices, and he talks about his motivation to collaborate in sowing plants for the community garden.

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