

FOSTERING A LIFELONG LOVE OF PLANTS: EDUCATOR STORIES FROM A BOTANICAL GARDEN

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Abstract

With a growing interest in community-based STEAM education, 10 environmental educators with the Vancouver Botanical Gardens Association share their experiences connecting people to plants at VanDusen Botanical Garden and Bloedel Conservatory, located on the unceded ancestral shared lands of the xʷməθkʷəy̓əm (Musqueam), Skwxwú7mesh (Squamish), and Səlilwətaʔ/Selilwitulh (Tsleil-Waututh) Nations. Each educator contributes various perspectives based on their unique backgrounds and lived experiences that culminate in a shared story of passion for the natural world and its belonging in STEAM education. This narrative demonstrates that STEAM education flourishes when informal and formal educators work collaboratively and embrace new educational opportunities, engage senses through experiential place-based education, explore Two-Eyed Seeing and reciprocity, include diverse perspectives and recognize how lived experiences shape worldview, share passion and curiosity with learners, and foster appreciation of the natural world.

Fostering a Lifelong Love of Plants: Educator Stories from a Botanical Garden

Introduction

On any given day, rain, or shine, you will find a team of passionate informal educators connecting people to plants at VanDusen Botanical Garden or Bloedel Conservatory. Brought together by their love of nature and experiential education, this group of educators consists of full-time, part-time, and casual employees, research fellows, co-op and career placement students, and volunteers. Located on the unceded ancestral shared lands of the x^wməθkwəy̓əm (Musqueam), Skwxwú7mesh (Squamish), and Səlílwətaʔ/Selilwitulh (Tsleil-Waututh) Nations, the Vancouver Botanical Gardens Association (VBGA) is honoured to- operate on these lands, where these Nations have lived since time immemorial, and where they continue to maintain reciprocal relations in nature. In 2022, the team shared their passion for a sustainable future through plant education on these lands with over 14,000 participants.

This group of unique educators work or volunteer with the Vancouver Botanical Gardens Association (VBGA). The VBGA is a charitable non-profit whose mission is to engage people of all ages and walks of life in the importance of biodiversity to our lives, and to foster among them a lifelong love of plants and gardens by virtue of their participation in our programs and services. The VBGA jointly operates both the Garden and the Conservatory with the Vancouver Board of Parks and Recreation to achieve a joint strategic mission to inspire a deeper understanding of plants, a passion for biodiversity, and to encourage generations to conserve, protect, and enhance the natural world. The Canadian Museums Association (n.d.) considers botanical gardens as museums, and like other museums, our Gardens include plants for public display, education, conservation, and research purposes (Jackson, 1999).

To guide the delivery of diverse mission-aligned programs for learners of all ages, VBGA educators look to nature as our teacher, and community as our council. For the VBGA, community includes VBGA members, education participants, teachers and students, Indigenous partners, and stakeholders in environmental sustainability. Collaboration strengthens our ability to provide deeper engagement in nature by incorporating unique lived experiences, knowledge, and experience in STEAM education. Engaging learners in experiential plant programming complements and strengthens learning in formal learning spaces (Bauerle & Park, 2012). By fostering a student's sense of belonging within nature, formal and non-formal educators can work together to encourage pro-environmental behaviour (Lumber et al., 2017).

Mirroring the carefully curated collections of plants growing in our Gardens, this is a collection of curated environmental education experiences facilitated in our 55-acre living classroom and under our lush tropical dome, as told from the perspectives of educators. The intention is to inspire community relationship-building outside of the formal classroom, which not only encourages a love of STEAM, but also empowers students to share their gifts with the world.

Aymara Pineda Barahona - Adult Education Coordinator

"Learning doesn't end after childhood; we can continue to engage our senses in nature for life."

As a child, it seemed implausible to me that my mother loved the smell of cow manure but hated perfumes. Despite being born and raised in an agricultural country, Nicaragua, I only developed a deep appreciation for nature as a young adult.

My connection began emotionally, and only after creating that bond and finding solace and peace in the Mombacho Volcano Natural Reserve during a challenging period, only then, it grew stronger as this experience motivated me to learn more about ecology, health, and our dependence on nature through courses, reading, and volunteering (Figure 1).

Figure 1. *A Day at Mombacho Volcano Natural Reserve*



Note. Personal photo collage provided by Aymara Pineda Barahona.

Now, as the Adult Nature Education Coordinator at VanDusen, I am thrilled to help promote and strengthen this connection in other adults, not only rationally, disseminating specialized knowledge on botany and gardening by professionals with academic and in-field experience, but also emotionally, upholding the idea that we, adults, need to experience the natural world with all our senses as it is the only way of saving and preserving the ecosystems we know today and on which our lives depend.

With the kind collaboration of eleven volunteer education hosts and the education team, our yearly calendar offers around 60 short programs that provide fundamental knowledge, tools, and skills for adults to deepen their understanding and connection with nature. Furthermore, the courses also serve as an opportunity for participants to build a like-minded community, supporting each other in their journey.

For instance, the "Growing Chinese Medicinal Plants in Your Garden" course led to the creation of a small community among participants interested in sharing their adventures on this subject since they think there is a limited direct experience in this field in the city. They started by organizing a picnic after the last session, a guided walk to identify and discuss the properties of Chinese medicinal plants growing in the Garden.

Similarly, the watercolour courses foster friendships among attendees who often return to meet their partners in art repeatedly. Everyone takes out their painting materials and sets up their worktable, participants choose the plant samples they like best from a variety of specimens we cut for them in the Garden to guide their drawing and painting, and there is calm energy in the air, including small conversations in the background. There is undoubtedly a flow in the classroom during art courses!

Our non-traditional educational programs also include, among others, Chigiri-Paper Art, storytelling and hula dancing at Bloedel Conservatory, guided walks through VanDusen with a focus on specific insects or plants, and the Multisensory Nature Immersion program, which is the new title given to the Forest Bathing or Forest Therapy program. The latter highlights the connection between outdoor learning, science, wellness, and heightened senses. This practice originated in Japan and studies on Forest Therapy have demonstrated a wide array of health benefits, especially in the cardiovascular and immune systems, and for stabilizing and improving mood and cognition (Hansen et al., 2017). There is a strong body of scientific evidence documenting health benefits, as outlined in the *Shinrin-Yoku (Forest Bathing) and Nature Therapy: A State-of-the-Art Review* by Hansen, M. M., Jones, R., & Tocchini, K. published in *The International Journal of Environmental Research and Public Health* (2017). Forest Therapy can support emotional, physical, psychological, and spiritual wellness while reducing stress and potential burnout (Hansen et al., 2017).

Participants often express their joy and gratitude for the valuable lessons they learn during this outdoor program, such as "being one with nature," "slowing down and tuning into the

senses," and "the importance of stepping away from the city to de-stress and appreciate nature's offerings."

Chantal Martin - Director of Education and Research

"STEAM education flourishes when we include diverse perspectives."

In my early adulthood, I learned from a neighbour that kale did not always look like the kale I eat in my salad, as it changes throughout its life cycle. I recall excitedly sharing my newfound knowledge with a friend. "Did you know this spindly plant with bean-like seed pods is kale?" I asked. My friend replied: "Here we go again, you're such a know-it-all!". Although my reaction in the moment was shame and embarrassment, I now encourage folks to share their nature discoveries with the world. I recognize that what was happening during my early adulthood was a growing curiosity for the plants around me, sparked by my community. In this case, my neighbour was growing kale amongst other food within their limited shared concrete parking space. She had learned this technique from her mother and generations past. Her knowledge of food-growing techniques was facilitated through hands-on engagement.

Since this time my curiosity bloomed from not only learning about the common food found on my plate, but also the traditional plant foods growing on these lands. I have had the honour and privilege to teach on the shared unceded traditional and ancestral lands of the xʷməθkʷəy̓əm (Musqueam), Skwxwú7mesh (Squamish), and Səlílŵətaʔ/Selilwitulh (Tsleil-Waututh) Nations, in the city commonly known as Vancouver, British Columbia for over 20 years. Xʷməθkʷəy̓əm, Skwxwú7mesh, and Səlílŵətaʔ/Selilwitulh peoples are stewards of these lands and have deep knowledge and connection to the plants and the land that have sustained their people for time immemorial. As environmental educators, we are part of the growing group of formal and non-formal educators that understand Indigenous perspectives and knowledge are crucial to learning on the land that we live on. We work to honour the host Nations' knowledge and protocols and continue to build relations in a good way. Understanding it is not our story to tell, we work with Indigenous partners to facilitate culturally appropriate and relevant education for youth and adults. We also purchase resources created by Indigenous Peoples such as Indigenous literature available for educators to borrow from our library and plant flashcards created by Indigenous knowledge keepers in our field trip programs. The education team prioritizes centering Indigenous perspectives and the teachings of reciprocity. Our community includes Indigenous Peoples, and we work to amplify their voices.

In delivering STEAM education, we approach with the lens of Two-Eyed Seeing as coined by Albert Marshall, a Mi'kmaq elder. *"Two-Eyed Seeing refers to learning to see from one eye with the strengths of Indigenous ways of knowing and from the other eye with the strengths of Western ways of knowing and to using both of these eyes together"* (Bartlett et al., 2012). Therefore, our educational programs also rely on the academic community.

For the past 4 years, we have awarded fellowships to students through the Institute for Environmental Learning. The fellows bring unique educational backgrounds but are also encouraged to share their lived experiences. Dr. Poh Tan has been a VBGA Fellow for the past two years, where she has been creating a virtual field trip titled “Classroom Visit to the Bloedel Conservatory.” Focused on STEAM education, the resource brings tropical plants to the traditional classroom setting. Dr. Tan highlights the unique relationships between people and plants, from the perspective of the people where the plants are endemic and naturalized. As a result of working with Dr. Tan, I have come to gain an appreciation for the bananas I pack in my children’s lunches regularly. Through Dr. Tan’s Malaysian-based storytelling included in the field trip, I learned of a ghost called Pontianak that lives in the banana tree. She explains that cultural stories such as these can be a preventative safety measure to keep children safe from the animals that live or interact with the banana tree. Learning about ecology is a by-product of this immersive cultural storytelling experience. Dr. Tan involved her community, by bringing her hula sisters, family, and other fellows together to make the virtual field trip a truly unique opportunity for elementary students and their teachers (Figure 2).

Figure 2. *Community Collaboration at Bloedel Conservatory*



Note. Personal photo provided by Dr. Poh Tan.

From learning the life cycle of kale, practicing reciprocity with plants, to gaining a better understanding of the cultural significance of bananas to global communities, I continue to not only be inspired by the biodiversity around me, but also by the natural and cultural knowledge of plants shared by the people who know them in their place.

Dennis Chen - Youth Programs Manager

“Field trips to botanical gardens have endless potential, such as enhancing classroom learning.”

Take the tip of a pipe cleaner and fold it over. The little bulb at the end is the average size of a mason bee. Fold it over again, and you have a shape representing a honeybee. Fold it once more and you will have the semblance of a bumblebee. Swipe the pipe cleaner against the stamens in a flower and observe the pollen collected by the bristles before depositing it in the next blossom (Figure 3). This exercise, which teaches students first-hand about the role that bees play in pollination, is just one example of the many activities featured in our field trip programs.

Figure 3. *Holding a Pipe Cleaner “Bee”*



Note. Photo provided by the Vancouver Botanical Gardens Association.

Highly accomplished educator, Alyx Kellington, explained that “field trips enrich and expand the curriculum, strengthen observation skills by immersing children into sensory activities, increase children's knowledge in a particular subject area and expand children's awareness of their own community” (Kellington, 2011, para. 5). This is exactly what we strive to do at the VBGA. As the Youth Programs Manager, one of my main responsibilities is to ensure that visiting students receive a learning experience that enhances their classroom education, often through tactile activities such as the one described in the previous paragraph.

It is this ability to enhance education that makes out-of-classroom learning important. For this reason, as Kellington continues, “often teachers look to the arts and cultural organizations of their community for field trip ideas: museums, zoos, science centers, and natural areas” (Kellington, 2011, para. 9). To help share the work that we do, the VBGA participates in the University of British Columbia’s Community Field Experience Program where, over the course of three weeks, elementary and secondary teacher candidates can observe, develop, and deliver the opportunities we provide students.

The most rewarding part of the work that we do is to see both teachers and students excited about the content they experienced. Hearing a group of children talking about the fuzzy bodies of bees or a teacher sharing that the “kids were very engaged [and the] activity was clear and age-appropriate,” are all signs that the education we provide is effective (Anonymous, personal communication, 2022). Field trips are important and vital for learning.

Jessica Henry - Adult and Family Programs Manager

“The best part about teaching a teacher is that you know the information or ideas you are sharing will travel outwards into the community and have a wide ripple of impact.”

Teacher Professional Development at VanDusen Botanical Garden is designed to create programs inviting teachers to consider the critical importance of plants to our world and ourselves. Plants are easily overlooked by teachers and curriculums alike, and many teachers I work with tell me that they possess little to no botanical knowledge, or even contact with plants beyond the grocery store produce aisle. Plants are everywhere, they are accessible (although, not with equal access), and they offer approachable ways to engage directly with the non-human biodiversity of species outside the classroom door.

With many more teachers in Canada beginning to embrace the concept of taking their students outside, with an extra boost to buy-in due to the pandemic, and mounting research showing the benefits to all of us for time spent in nature settings (Capaldi et al., 2015), our outdoor-based professional development programs are driven by a desire to invite teachers to step into the Botanical Garden and create a connection to the wide world of plants.

As a long-time, non-formal educator with decades of experience in wilderness, agricultural, and urban-wild spaces, my primary goal, outside of the formal content and skill-based learning objectives for all teacher education programs, is to create immersive personal experiences that generate wonder and curiosity in teacher participants, first and foremost.

The experience of engaging with the natural world, let alone the concept of taking your students outside to learn, can be daunting for many teachers who may not come from a personal or cultural background where spending time outside, with dirt and mud, insects, and weather is the norm. How can we task teachers with asking their students to make meaningful, personal connections to the wilder world if they themselves are not making these connections or having these experiences? A Botanical Garden, or similarly familiar and curated outdoor space, can be a welcoming environment to ask people from any background to step off the paved path for a moment and engage (Figure 4). A Garden can be a surprisingly wild space, albeit a gentle and domesticated sort of wild, and in this accessible environment, we can facilitate a host of novel nature experiences.

Figure 4. *A Moment of Connection to the Learning, Inside the Douglas Fir Grove at VanDusen Botanical Garden*



Note. Photo taken by Tina Chin for the Vancouver Botanical Gardens Association.

Teachers tell us they come to workshops at the Garden to gain new knowledge, take home new activities with which to engage their students back in the classroom, and enjoy the beauty of the space, but the biggest seems to be in the opportunity to step off the path and stand under the canopy of a Giant Sequoia, with an invitation to look up and wonder about the life of this non-human organism, and how that life is connected to theirs.

Layered with relevant knowledge and skill transfer, practical modeling of outdoor-education best practices, and applicable classroom activities and resources, our goal is to craft opportunities to connect these personal nature experiences to curriculum and spark a curiosity teachers can take back to their classrooms to ignite similar moments of connection with their students.

Madelena Klein – UBC LFS Summer Career Practicum Student

“Through experiential education programs at VBGA, the presence of STEAM/STEM subject matter provides an individualistic, transferrable and resonant connection to plants and nature for students and campers alike.”

Throughout my summer practicum placement with VBGA, I have experienced firsthand the multifunctional nature-based education, specifically in the scope of youth programming. My placement began in mid-May; so my position has seen the last portion of the school year and the

majority of summer camp facilitations. Specifically, my role as a camp assistant focuses on both administrative and facilitative matters of camp. I have had the privilege of leading campers through workshop installments of interactive activities and games (Figure 5). Through experiential education programs at VBGA, the presence of STEAM/STEM subject matter provides an individualistic, transferrable, and resonant connection to plants and nature for students and campers alike.

Figure 5. *Children Investigating Stumps for Decomposers During a Workshop Installment*



Note. Photo taken by Tina Chin for the Vancouver Botanical Gardens Association.

Coming from a nutrition degree background, themes of food literacy are familiar to me and have been explored throughout my courses. In an environment such as the Garden, this presents itself in an even more integrated manner. Food literacy can be taken from the classroom with direct and tangible experiences to foster an evolving connection to food and the strong foundation of an evolving food literacy.

Throughout my experience, it has been clear that fostering connections to nature that radiate beyond the borders of the Garden is the value of VBGA's programs. A self-driven, hands-on discovery through nature-based education has impressionable impacts on the student or camper that has the power to develop into an evolving and continuous connection, appreciation, and curiosity of nature. I have realized the activities that seem to be the most effective and

engaging are those that highlight agency, collaboration, and individualistic curiosity. These same principles present themselves in a nature-situated learning environment. This application and experiential moment for a student or camper is one they can own, apply, and recognize in a variety of environments, ultimately cultivating a developing relationship with nature.

Marina Princz - Library Coordinator

“One’s passion can leave an indelible mark on a student, and spark something one could never foresee.”

It has been such a pleasure to see little ones first gain that excitement for learning and understanding the natural world in which they live!

As the Library Coordinator, I have been organizing Preschool Storytime at the Yosef Wosk Library & Resource Centre at VanDusen Botanical Garden for the last 6 years. The volunteer teachers I have worked with have been extremely passionate about passing their knowledge and enthusiasm onto the 3 to 5-year-olds (and their families) who attend the program (Figure 6).

Figure 6. *Preschool Storytime at the Yosef Wosk Library & Resource Centre*



Note. Photo taken by Tina Chin for the Vancouver Botanical Gardens Association.

Many of the children, especially those with older siblings, proudly speak about our library's Storytime program as their 'school', and our volunteer staff as their 'teachers.' Here, once a month, they join us for stories, songs, and a simple science or art-based project. We typically run a 2-year cycle with families since once the little ones reach 5, they move on to kindergarten or home-schooling.

Recently, Marilyn and Beverly, our Preschool Storytime volunteers spent a couple of hours in the library to plan for the upcoming fall programming. As life sometimes sweetly and unexpectedly provides, Leo- one of their 'graduates' who had regularly come accompanied by his grandmother, walked through the door. He had been a very bright little boy who always sat cross-legged at the front of the carpet, asked (and answered) many questions, and regularly reported back on the progress of the seeds they had started in the science project part of the program. Leo is now finishing grade 4, and we had not seen him for almost 5 years. Despite having grown tall and mature, he remains talkative and enthusiastic, is still passionate about science and nature, and has taken part in several nature-based enrichment programs over the past few years. In our 15-minute conversation, he specifically expressed his fond memories of Preschool Storytime and his love for VanDusen Botanical Gardens.

As Leo and his grandmother left, Marilyn wiped tears from her eyes. She said that she was feeling overwhelmed with joy because reconnecting with this older version of Leo made her realize the long-term impact of the work, she had so whole-heartedly put herself into since retirement. This unexpected meeting with a previous 'student' not only demonstrates the positive impacts of teaching young children about nature and natural cycles, but also that putting her heart, soul, and enthusiasm into her teaching ignited a similar passion in the little ones. This made her both happy for Leo and gave her hope for the future.

Natasha Friedmann - Assistant Manager of Youth Programs

"Exclaiming, "Go play outside" isn't a punishment, it's a privilege."

I will never forget the feeling of my hands sinking into the mud with a youthful fervor – as a child, I reveled in every moment I spent outside, and when my family moved from an upstairs townhouse to a freestanding house with a backyard, I was convinced it was all a dream. Hardly grown enough to see over the kitchen counter, I had not yet realized the privilege we held in this opportunity, nor did I fully appreciate the implication of having my own "mud kitchen" before they were known colloquially as such. Decades later, the importance of this type of exposure is the foundation of our programs and the driving force in our organization's mission and vision.

A large portion of the families that we serve fall under one of two categories: 1) Children that have extremely limited access to nature at home or at school in an urban environment like Vancouver (who we fondly refer to as "condo kids"), and were raised during the height of the

COVID-19 pandemic, further fracturing them from social and emotional connections made outdoors and in environments like schools, recreation programs, camps, etc. Or 2) Families from diverse backgrounds, often experiencing socio-economic hardship or other barriers to participation, such as recent immigrants, single caregivers, or those with disabilities. In any case, we believe that our programs, such as nature-based day camps (Figure 7), provide integral experiences and opportunities for fostering environmental literacy and age-appropriate outdoor play, as well as introducing concepts and careers in STEAM/STEM beyond a rigid concrete classroom. Whatever the reason, these young folks are susceptible to a disconnection from nature so detrimental to development it was once coined ‘nature deficit disorder’ (Louv, 2005).

Figure 7. *Leading Children on a Scavenger Hunt During a Camp*



Note. Photo taken by Tina Chin for the Vancouver Botanical Gardens Association.

Here, campers conduct experiments, hone navigation, design, and problem-solving skills, explore current events and young leaders and change-makers, use tools and technologies, and learn about life cycles and human interactions with the local ecology and First Peoples’ Traditional Ecological Knowledge. The weight of this exposure is ultimately amplified by the stark reminder that this may be the participants’ first exposure to an outdoor learning environment, or their first time applying or interacting with STEAM/STEM in a setting where none of the outcomes are graded.

Nathan Fong – Environmental Educator & Camp Leader

“Connecting children to place allows us to provide deeper and more meaningful learning opportunities than they might experience in a traditional classroom.”

As someone who has lived his whole life in Vancouver, VanDusen Garden has always been a magical place. Towering trees, beautiful blooms, and a plethora of unique and rare species from across the globe find their home in one 55-acre plot of land in the middle of a bustling city. However, the most impressive aspect of VanDusen Garden is its ability to spark wonder and exploration by connecting people to place. In my role as a Camp Leader and Environmental Educator at VanDusen, I have had the privilege of witnessing countless instances of learning when children make connections to something in the garden (Figure 8).

Figure 8. *Children Examining a Story Pole in the BC Habitat Garden*



Note. Photo taken by Tina Chin for the Vancouver Botanical Gardens Association.

Spaces like VanDusen Garden offer a unique opportunity for children to learn differently than they might be able to in a traditional classroom setting. Classroom lessons and even experiments can sometimes be presented as carefully scripted talking points that may help children learn specific information but often fail to provide them the opportunity to enter into more complex learning (Clifford & Marinucci, 2008). While youth programming at VanDusen is typically themed and planned, I have come to see these plans more as guidelines that allow deeper learning to occur naturally. The ever-changing and energetic nature of summer camp also contributes to our ability to drop a pre-planned activity and take a deep dive into questions such

as, “Why are there mushrooms growing under that bench?” or, “Why do some of those ants have wings but others don’t?” I’ve witnessed children make connections to these embodied and real learning experiences that happen in the garden that allow them to draw greater conclusions to questions they have had about the world around them.

A pertinent example of one such connection comes from a few summers ago while I was leading a group of campers on a bird walk through the garden. Our organism of the day for that day was the black-capped chickadee so we provided campers with some basic information about the bird during our morning meeting. While on the bird walk, I asked the group to recount some of the information we learned about chickadees and questioned how that might help us spot them. Many of the campers responded by highlighting the chickadee’s unique mnemonic call where it seemingly repeats its own name. At that moment, we passed through a spot in the garden where chickadees were making that exact sound and the campers furiously focused their binoculars to try to get a glimpse of the action. From that point on, the walk became much more engaging as every new bird call ushered forth a chorus of voices exclaiming, “What was that bird?” or, “that one sounded different,” and, “I think I’ve heard that one before.”

A year later, while I was leading a different camp, one camper from that previous group ran up to me to share what her experience on that day taught her. Not only was she able to teach her new camp group about chickadees and identify them a year later, but she also learned that chickadees do not just live in Vancouver because she identified them while on vacation in another city. By forming a connection to her experience at VanDusen, this camper was able to learn new information beyond what we included in our plan for that one simple activity. Powerful learning opportunities such as this small example are plentiful in a space like VanDusen, where connecting to place allows us to push past the boundaries of a traditional classroom and engage children to learn about science in a deeper and more meaningful way.

Sangeeta Thomas- Teaching Garden Coordinator

“Plants may be silent, but they have remarkable, fantastic lives. Informal education can be very effective in telling their stories.”

Walking upon an outdoor space, e.g., an urban park, what is the first thing you notice? Most people may respond with “swing set,” or “a crow on a picnic table.” It would be a rarity if someone pointed out a tree, and rarer still, choose to mention a plant by name. “Plant Awareness Disparity” is a phenomenon where people fail to notice the existence and significance of plants in their daily lives (Brownlee et al., 2021).

I was like this for 22 years until one summer. Tired of being in lecture halls, I signed up for a plant course that took place outdoors. The professor took us on walks, where he would stop every few meters to share stories: stories of botanical discoveries, ethnobotanical uses, plant adaptations, and plant explorer adventures. We collected specimens to create an herbarium and

sketched our observations. I was nothing short of amazed by the knowledge contained within a small area! Being someone who previously had no affinity for the outdoors, thereafter I strove to do what that professor did for me: connect people to plants.

Having now led a variety of educational programming, such as preschool nature programs, adult-guided tours, and intergenerational hands-on workshops, I believe everyone, regardless of age, is wired to adore plants if provided with an initial spark. (Figure 9).

Figure 9. *Reading Provides an Opportunity to Calm Down, Collect Thoughts and Have Discussions Amidst a High-Energy Outdoor Pre-School Program*



Note. Photo taken by Tina Chin for the Vancouver Botanical Gardens Association.

Integrating diverse snippets of information about history, cultural uses, arts, and storytelling breathes life into the environmental sciences in a positive, engaging environment that makes participants feel delighted in our natural world. Many participants come back for more workshops, slowly fostering responsibility for conservation. Having mixed-age programming is effective in helping people across generations find common ground and connect to nature in ways only people of each age can make apparent. Having children around can help adults see things with eyes of playfulness and imagination, while adults can support children as their passions grow. Informal educational settings like the botanical garden help balance out the overall helplessness people feel when trying to learn about current environmental problems. Plants contain many sensational life stories; my job as an informal educator is merely to tell them.

Terrisa Yuan- Senior Environmental Educator

“Through immersive field trips, we bridge gaps in access to nature, fostering exploration and cultivating a profound connection with the natural world for every child.”

As a child growing up in the suburbs, I was blessed with the incredible privilege of having direct access to a spacious urban green space right in my backyard. Beyond the joy of playing, the green space offered valuable opportunities for experiences that instilled a sense of wonder and appreciation for nature in me. As I grew older and understood more about the concept of urban green equity, I realized that not all children have the same privilege as I did during my childhood. This realization ignited a passion in me to commit to creating opportunities for children to experience the wonders of nature, no matter where they live.

As the Senior Environmental Educator, I bring this commitment alive by facilitating field trips for elementary and secondary school students at the Garden, giving them a chance to explore, play, and connect with the natural world on field trips such as Pollinator Days (Figure 10).

Figure 10. *A Student Practicing Their Observation Skills in the Garden*



Note. Photo taken by Tina Chin for the Vancouver Botanical Gardens Association.

Pollinator Days is a 3 day-long field trip adventure for young nature enthusiasts, aiming to inspire their curiosity about pollinators and the environments that support them through STEM/STEAM activity stations that can be explored at their own pace. Teachers from all around Metro Vancouver bring their classes to VanDusen to explore the special relationships between plants, pollinators, and people. Our facilitators and community partners promote curiosity and stewardship through fun, diverse, hands-on activities at stations throughout the Garden that encourage new discoveries while aligning with the British Columbia curriculum. Our field trip festival's success is fueled by the active participation of numerous community partners who share a common interest in conservation and science education. They offer an array of rich and diverse perspectives that empower students to develop their own opinions and discover the STEM/STEAM areas that resonate most with them as learners.

Quinton et al. (2022) suggests that the relationship between proximity to urban vegetation and several factors such as household income and education is quite strong for Canadians living in cities. The VBGA strives to improve green equity through bursaries that are available for underserved schools and communities. It is through these bursaries that we, as non-formal educators, can foster a lifelong connection to the environment for future stewards of our planet. This is achieved through the transformative power of urban greenspaces in collaboration with STEM/STEAM learning opportunities outdoors.

Conclusion

At the Gardens, we plant the seeds of curiosity for our community, as someone or Mother Nature herself once did for us. For example, when a neighbour displayed kale's life cycle through gardening, or when Mombacho Volcano Natural Reserve sparked an interest in ecology, health, and dependence on nature, our educators were inspired to share and explore this newfound knowledge. These teachable moments can happen anywhere spontaneously; VanDusen Botanical Garden and Bloedel Conservatory provide endless natural opportunities to spark learning. When knowledge is passed on to our educators or when our educators pass on their learning experiences in the gardens or online, a community of passionate nature lovers continues to grow. For example, when a teacher visits us for professional development, they might stand under a Giant Sequoia looking up with amazement, and encourage their students to do the same, under any tree in their school yard or neighbourhood. Or when a career placement student develops and facilitates STEAM activities that incorporate their academic studies in nutrition, combined with their new learning at the Garden of traditional Indigenous foods, they return to their school and share Two-Eyed Seeing perspectives with their classmates. Through this collection of experiences shared by the VBGA's educators, a story of opportunities emerges.

The VBGA story demonstrates that STEAM education flourishes when we (informal and formal educators):

- Engage our senses through experiential place-based education.
- Commit to being lifelong learners and open our hearts and minds to Two-Eyed Seeing.
- Include diverse perspectives and practice reciprocity with all people and the land itself.
- Work collaboratively inside and outside of the formal classroom.
- Spark curiosity for the learner by demonstrating our passion and curiosity.
- Embrace new opportunities for collaboration, often without a prescribed outcome.
- Recognize lived experiences and privileges shape how we experience the world, including STEAM education.
- Foster an appreciation of the natural world, with plants and humans included.

STEAM education facilitated through botanical gardens can spark a love of plants as demonstrated by the experiences of the VBGA's informal educators. Furthermore, these shared experiences reveal that STEAM education is engaging when community is involved, and approaches are diverse, creative, and collaborative.

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