

ROOTS

BOTANIC GARDENS
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INTERNATIONAL
EDUCATIONAL REVIEW

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LEARNINGS FROM CONGRESS 2022



**BOTANIC
GARDENS**
CONSERVATION
INTERNATIONAL

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FIRST WORD

LEARNINGS FROM CONGRESS 2022

Helen Miller
Head of Education
and Vocational
Training
BGCI



Over the last few years, due to the COVID-19 pandemic, many national and international congresses have been cancelled or moved on line. With the loosening of restrictions and opening up of society again, 2022 has seen the return of many of these events. The opportunity to get together again, share best practice, lessons learnt over the last few years as well as discuss future calls to action for botanic gardens has been a welcome change.

In this latest issue of *Roots*, we take a look at three congresses that took place this year, providing an overview of the events and some key highlights. We have also invited speakers from these three events to share their experiences of the Congresses as well as provide a summary of their presentations.

On 16-20 May, the Hungarian Association of Arboreta and Botanic Gardens hosted the IXth European Botanic Garden Congress in Budapest. The theme of the Congress was 'Where people and plants meet'. You can read a summary of the Congress as well as articles from two of the presenters (from the University of Warsaw Botanic Garden and Gothenburg Botanical Garden) on pages 2-11.

The American Public Gardens Association's Annual Conference was held in Portland, USA in June. The theme was "CommUNITY of gardens" with the Conference highlighting the interconnectedness of gardens and their communities for the cultivation, security, and betterment of our planet, ourselves, and the future. You can read more about the Conference and presentations by United States Botanic Garden, Art-Reach and University of Washington Botanic Garden on pages 12-23.

Finally, BGCI's 7th Global Botanic Garden Congress took place in Melbourne, Sydney after an 18 month delay due to the pandemic. The theme of the Congress was Influence and action: botanic gardens in a time of change. This event included a dedicated education day, implemented after the cancellation of the education congress (which was also due to take place in 2022). You can read more about the event and from presenter Behaviour Works on pages 24 – 28.

I hope that this issue gives those who were not able to attend these events a taster of the varied and interesting talks, sessions and discussions that took place and allows us to look forward to the return of many more botanic garden Congresses and Conferences over the next few years.



(Eurogard)



(Picture Courtesy of APGA; photography ©ThomasBollinger.com)



OVERVIEW OF EUROGARD

Eurogard IX was the first major conference after the pandemic and many were looking forward to seeing each other after such a long period of self-isolation. Located in the beautiful city of Budapest, and coinciding with the 30th anniversary of the Hungarian Association of Arboreta and Botanic Gardens, and the 250th anniversary of Hungary's first botanic garden at Eötvös Lóránd University- More reasons to celebrate!

The IXth European Botanic Garden Congress (Eurogard) provided an opportunity for 250 people to share knowledge, learn from each other and, perhaps most importantly of all, network. During the first hours of conversations gardens were keen to talk to each other about the pandemic, how it affected them, and how they are slowly recovering. For many the pandemic gave teams, especially botanic teams, time to pause and re-evaluate their strategy and this flowed through many of the education talks presented throughout the congress.

The theme of the congress was 'Where People and Plants Meet' and during the week there was some inspiring examples of the education and engagement work carried out by botanic gardens across Europe. However, the main education learning agreed by attendees was that, in order to further engage effectively, we have to continue to build our relationships with local communities, including through citizen science projects, identifying needs of the visitors, and ensuring that our messaging is clear and consistent.

Above: The congress delegation for Eurogard IX in Hungary (Eurogard)



Budapest (Pixababy)



Other talks included:

1. **Models of Fabaceae flowers as tools for understanding interactions between form and function** Daniela Hlavka,
2. **Podcast your garden** Stina Weststrand Åsa Krüger, (see page 9)
3. **Designing educational offer for children with children - the case of the new interpretation system at the University of Warsaw Botanic Garden** Anna Albin, (see page 6)
4. **New topics in an old garden - contemporary educational challenges at the University of Warsaw Botanic Garden** Magdalena Oprządek,
5. **Science communication in botanic gardens: the European panorama** Andreia Jorge,
6. **Phenological observations with secondary schools** David Bröderbauer,
7. **Virtual versus physical during covid-19 pandemic - reflections from the experience of the botanic garden "Brandza" in Bucharest** Petronela Carmen-Comanescu,
8. **The main dendrological values of the Buda Arboretum, its role in higher education and environmental education** Péter Honfi,
9. **Dissemination and awareness-raising in the National Botanic Garden** Éva Szakács,
10. **Botanic garden visitors do not waste food!** Dominic Grantley-Smith.

The next few pages provide some articles from two presenters of the congress about their work and their experience at the Congress.

To see the full list of learnings from the Congress: please see: <https://eurogard2022.congressline.hu/wp-content/uploads/Conclusions-presented-at-EUROGARD-IX-Budapest-May-2022-final.pdf>

Opening speech at Eurogard (Eurogard)



Eurogard Networking event (Eurogard)

CONGRESS

- 9th European Botanic Gardens Congress (EuroGard IX)
- 16 and 20 May 2022
- University of Public Service
- Where People and Plants Meet
- Budapest, Hungary

GIVE KIDS THE VOICE!



In September 2020 the University of Warsaw Botanic Garden conducted a participatory project called “InfOgrodek” to determine how children would like to spend time in the Garden, what they would like to learn and how. The project ended with a list of recommendations for child friendly education.

1. Learnings from the Congress

When I started working at the University of Warsaw Botanic Garden (UWBG) back in October 2019 I did not know that the first two years of my job would be mostly shaped by the COVID-19 pandemic. During this time, the work of the education team, which I am a part of, was limited to producing online content and organising outdoor education activities in the short breaks in between pandemic lockdowns. I participated in two online, hybrid conferences, both interesting, but with the “networking factor” limited mostly to chatting on the internet platform. In this regard, the Eurogard conference in Budapest was a totally new experience, new quality and a real immersion into the world of botanic gardens. For me, the highlight of the conference was the people and the face to face contact. We could have what seemed like endless conversations about “how it is in your garden and how it is at ours”. There were great field trips and generally the feeling of enhancing the network of contacts among European botanic gardens.

There were also many interesting and inspiring lectures. What my UWBG colleague Magdalena Oprządek and I remember the most, was the focus on citizen science and participatory approaches in education. For Magdalena, the highlight was the talk by David Bröderbauer of the Vienna Botanic Garden, which was about phenological observations with secondary school students.

Above: Painting was one of the most popular activities (Iza Kuzyszyn)

For me, the highlight of the conference were the people and the face to face contact.

So what do children want to do at our Garden? Make research and conduct observations, paint flowers, climb trees, and learn about fungi – these are just a few examples from the wishlist. Doesn't sound so bad, right?



Magdalena has been considering running a similar kind of project at UWBG for some time now and it was inspiring to see that this idea was successfully developed elsewhere. It is also good to know that software supporting phenological observations, like PhenObs, exists and is accessible.

For me, a very memorable presentation was by Koen Es, who summarised big changes which were undertaken at the Meise Botanic Garden. Over a couple of years an enormous, well-thought-through modernisation was conducted, with a great result. Currently, at UWBG, we're also working on big educational projects, so it was interesting to see their garden in a similar process.

2. Our presentation

In Poland we have a saying "Kids and fish have no voice". At the University of Warsaw Botanic Garden, we do not have much to do with fish, however children are the major recipient of our educational offer. That is why, contrary to the aforementioned saying, we decided to give the voice to our youngest visitors, while designing the new interpretation system.

The project is called "InfOgrodek" and took place in September 2020. To participate we invited one of the local homeschooling groups. The group consisted of 12 kids, aged 3 to 11, who were familiar with each other and who could visit us during the working week.

But how do you get useful information and ideas from three year olds? It might not be obvious how to work with such small children during the designing process. Luckily, there is the book "Transforming learning spaces. Children's and adult's participation in designing learning environments" by Alison Clark: <https://www.routledge.com/Transforming-Childrens-Spaces-Childrens-and-Adults-Participation-in/Clark/p/book/9780415458603>. This was our guidebook throughout the process. Clark describes various methods, provides guidance on how to implement it, lists possible pitfalls and gives examples of similar projects.

The project's programme lasted four consecutive days. During this time the kids visited us every day for around three hours. Each day was a different stage of the design process and we used different methods to extract information. Throughout the project we emphasized how important the presence and perspective of the children was. We even called them our "experts on being kids" and they were clearly fond of this expression.

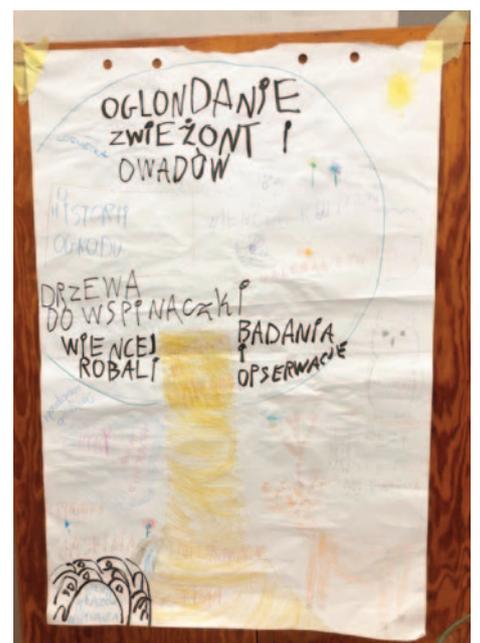
Day one started with a guided tour around the garden. Afterwards, we gave the kids freedom to do whatever they wanted. We established several "activity stations" with different learning and playing accessories, among others a birdwatching station, a painting station, and a music station with natural instruments. We, the hosts, were observing and noting down what children used the most. One of the most popular attractions was the Pollinator Observer game. The kids also, by chance, met scientists studying rodents. With fascination they observed their work and mice measurements.

Left: After each day we were together to summarise our progress (Iza Kuzyszyn)



Finding hollows, hidden spots and hideouts is important for kids (Iza Kuzyszyn)

Children can tell you their preferences, critically examine their wishes, and adjust to the reality.



Kids wishlist (Iza Kuzyszyn)



Left: Kids using different learning accessories on day one (Iza Kuzyszyn)

On day two, the experts got tablets to take pictures of their favorite places around the garden. They were free to photograph whatever they wanted. Afterwards, on the computers, each team had to choose their 10 best pictures, make a poster and present it. We were surprised at the kind of detail the kids paid attention to and how varied their interests were.

On day three we swapped roles - now the children were our guides and, in pairs, took us for a walk around the garden. They showed us places they liked the most, places that could be improved and places that they did not like. Afterwards, in the classroom, we did a participatory mapping exercise, marking all these places on a big garden map and discussing it. The most problematic part was the dislikes, but our young experts found some, for example no access to our tiny pond with a waterfall.

The aim of day four was to create a wish list. It is often not easy for kids to imagine what could be, that it is not currently there. That is why first we did some imagination-generating exercises. We read them a self-written story about a plant-boy, who is visiting a magical garden and has various adventures. Next we made a "journey on a flying carpet" - a slideshow with educational solutions from different botanical gardens. Finally, there was time to make the wish list. The young experts handled this task brilliantly. First they listed all the wishes and then, themselves, excluded the ones that were not feasible to implement (for example a trout fishing pond). Then the parents joined us for a final celebration. After the event, the parents were asked to go to the garden with their kids and fill in a questionnaire on what is missing in the garden from their perspective.

So what do children want to do in our Garden? Make research and conduct observations, paint flowers, climb trees, and learn about fungi - these are just a few examples from the wish list. Doesn't sound so bad, right?

The other part of the work - designing practical solutions, happened after the project. Still, we tried to stay true to the children's' vision and we decided to implement many of their wishes. The core of the new kids'-directed interpretation will be the Nature Observer Sets that will be available to hire at the counter. Each Set will be equipped with different tools and accessories to become a junior-scientist, even for a few hours. We are also planning on developing a special citizen science programme that would be associated with the Nature Observer Sets. The project is currently still at the design phase.

To summarize, InfOgrodek was a very eye-opening and inspiring project. We were astonished how much specific information and input we got from the kids. Therefore, we highly recommend involving children in the design process or at least consulting with them - they can tell you their preferences, critically examine their wishes and adjust to the reality.



Taking pictures on day two (Iza Kuzyszyn)

We called the children our experts on being kids and they were clearly fond of this expression.

We were astonished how much specific information and input we got from the kids.

REFERENCE

Clark, A. (2010). *Transforming Children's Spaces. Children's and Adults' Participation in Designing Learning Environments*. Routledge.

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PODCAST YOUR GARDEN



Gothenburg Botanical Garden podcast (“Botaniska trädgårdspodden” in Swedish) is one of the few podcasts produced by botanical gardens in Europe. It was started in 2016 and is currently reaching about 3000 listeners per monthly episode. The podcast format represents a modern and accessible channel for working with education and outreach.

www.botaniska.se/podd



Left: Visiting the exhibition “Never Alone – the Secrets of Symbiosis” (Åsa Krüger)

Above: Cover picture for Botaniska trädgårdspodden (Ellinor Smederöd)

1. Learnings from the Congress

We were four people from Gothenburg Botanical Garden, Sweden, who attended the EuroGard congress in Budapest in May. The week was very inspiring, and we have taken back the following points from the congress to our garden:

- The progress of work on the post-2020 Global Strategy of Plant Conservation within the Global Biodiversity Framework. Several speakers sent the message that working together, we as botanic gardens form a strong network of knowledge and genetic resources for conservation and biodiversity. It became clear that botanic gardens have an important role to play in such policy processes. We were inspired to continue to influence Swedish policymakers and take an active part in this work.
- The importance of collection management and the best use of metrics. Improving data quality enables more precise communication with different target groups: stakeholders, foreign governments and institutions, scientists, and when talking to the public. With more transparent data and well documented workflows, our collections could become easier to share and this will facilitate new collaborations and global plant exchange.

*Botanical gardens –
a network of biodiversity.*

*The network of botanic gardens
is a great platform to exchange
ideas in a friendly and positive
atmosphere.*



- Several innovative ideas on plant biology education, for example inspiration on different ways to interact with students and the public. From how to make plant exhibitions more accessible with the exhibition “Never Alone – the Secrets of Symbiosis” where smell, touch, and taste were as important as sight, to creating your own flower model, even including pollination syndromes. This inspired us to continue to think outside the box and strive for more multi-disciplinary collaborations for sharing science.
- The commitment seen in many, if not all, botanic gardens to work with citizen science projects in one form or another. In Gothenburg, we will continue with our ongoing citizen science project and are eager to expand our knowledge. The next project will probably be to try out a BioBlitz.
- A strong sense of community. The network of botanic gardens is a great platform to exchange ideas in a friendly and positive atmosphere. When we met in person it became very clear that we all work towards a common goal. We look forward to continue to collaborate!

2. Our presentation

During the first day of the congress, we (Åsa and Stina, scientific curators and podcast hosts) were part of the session “BGs as experience-based class-rooms”, with the talk “Podcast your garden”. To give the audience a feeling of Botaniska trädgårdspodden, we entered the stage to the sound of our podcast jingle and started off by demonstrating how a recording session sounds. This was later included in our episode about EuroGard. We usually record outside in the botanical garden, among plants and together with radio producer Nina Frogneborn, so this was a special setting.

We discussed the efficiency and reach of the podcast format as a communication channel for botanical gardens. With our podcast as an example, we presented workflows, challenges, and future possibilities. We wanted to share our experiences, get inspired, and inspire others. Several colleagues showed interest in starting a podcast and we strongly encourage others to try it out. It is a good complement to other outreach activities, for example during the pandemic the podcast made it possible to reach our visitors despite restrictions on guided tours and events.

Recording the podcast in Gothenburg Botanical Garden (Ellinor Smederöd)

The podcast format represents a modern and accessible channel for working with education and outreach.



Podcast guest Alexandre Antonelli (Åsa Krüger)

As a botanical garden production, we believe it is important that our podcast has a focus on specialist knowledge and in-depth conversations. Discussions on plant evolution, research, and cultural history are mixed with hands-on gardening advice and inspiration. We aim to reach a broad audience, engage people, and make them curious about the world of plants. Inviting the listeners behind the scenes at the garden, where they learn about both the plants and how we work with our collections, distinguishes Botaniska trädgårdspodden from more traditional gardening podcasts.

The language is Swedish which limits the reach but is in line with the long-term goal set by our principal (the county council): "Gothenburg Botanical Garden should be of importance to the whole of West Sweden". Each episode is approximately 30 minutes and usually has one part to present the theme, one part with a guest, and a short end discussion. The length is intended to be a good fit during a commute or a chore, and to keep the listeners interest for the full episode. Themes are decided by a small editorial board consisting of the podcast hosts, the producer, a communicator, and an event manager. They are linked to relevant events and activities in the garden and should always include an element of "behind the scenes".

From our experience, it does not take much to start a podcast, but the amount of work depends on one's level of ambition. We had an ambition to reach a broad Swedish-speaking audience and felt the need for professional help to achieve high quality sound and editing. We decided to hire an external radio producer, a decision that needed funds. Gothenburg Botanical Garden is lucky enough to have a large and strong society of friends of the garden and they had the funds to sponsor the podcast. With this set up, we have been able to do ten episodes per year since 2016.

Overall, we are happy with the podcast setup in Gothenburg, but there are of course always things to improve! When attending EuroGard, we wanted to take the opportunity to ask the community for help. One question was how to better understand and communicate with our audience. Right now, we get non-personal statistics on for example the number of unique listeners. Instagram is used to get reactions and messages on the podcast, but this is a limited channel and often one-sided. We were recommended to try TikTok and discussed the potential in working more with video. The community also emphasised the value of exposing the podcast in the physical garden and for example at garden shows. In addition, we got the request of having the podcast, or parts of the episodes, in English.

We thank the community for a fruitful discussion and hope to hear more garden podcasts in the future! A final word of advice: When getting the podcast going, do not forget to have a good time when recording and preparing for the episodes. Dig into different topics and talk to colleagues to learn more about their areas of expertise. This is inspiring and will engage your listeners.

The whole episode from the EuroGard week can be found here: <https://botaniskaträdgårdspodden.libsyn.com/avsnitt-64-resan-till-budapest>. Besides recording parts of our presentation, there are also bits from the excursion day and our train journey to and from Budapest. We concluded that going by train is a very good way of travelling between different botanic gardens in Europe!

All episodes of the Gothenburg Botanical Garden podcast can be found here: www.botaniska.se/podd, and a teaser: <https://youtu.be/D1FrTjmlErM>



Presenting "Podcast your garden" during EuroGard (Hanna Tornevall)

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Excursion to the saline steppes at Farnos (Stina Weststrand)



OVERVIEW OF APGA

The American Public Gardens Association’s Annual Conference was held in Portland, Oregon in June 2022. This was the first in-person meeting in two years, and many people were looking forward to networking and seeing colleagues in person again.

The American Public Gardens Association is one of the leading professional organizations for public horticulture in North America. They advance the field by encouraging best practices, offering educational and networking opportunities, and advocating on behalf of their members, their programs and public gardens worldwide.

This year’s annual conference theme was “CommUNITY of Gardens” and was perfectly reflected by their conference destination, Portland, Oregon. It is a beautiful “City of Gardens”, recently at the forefront of prominent social, environmental, and community issues. The CommUNITY of Gardens Conference highlighted the interconnectedness of gardens and their communities for the cultivation, security, and betterment of our planet, ourselves, and the future.



Above: APGA Poster
Top: Atlas Obscura Crystal Springs Rhododendron Garden Portland



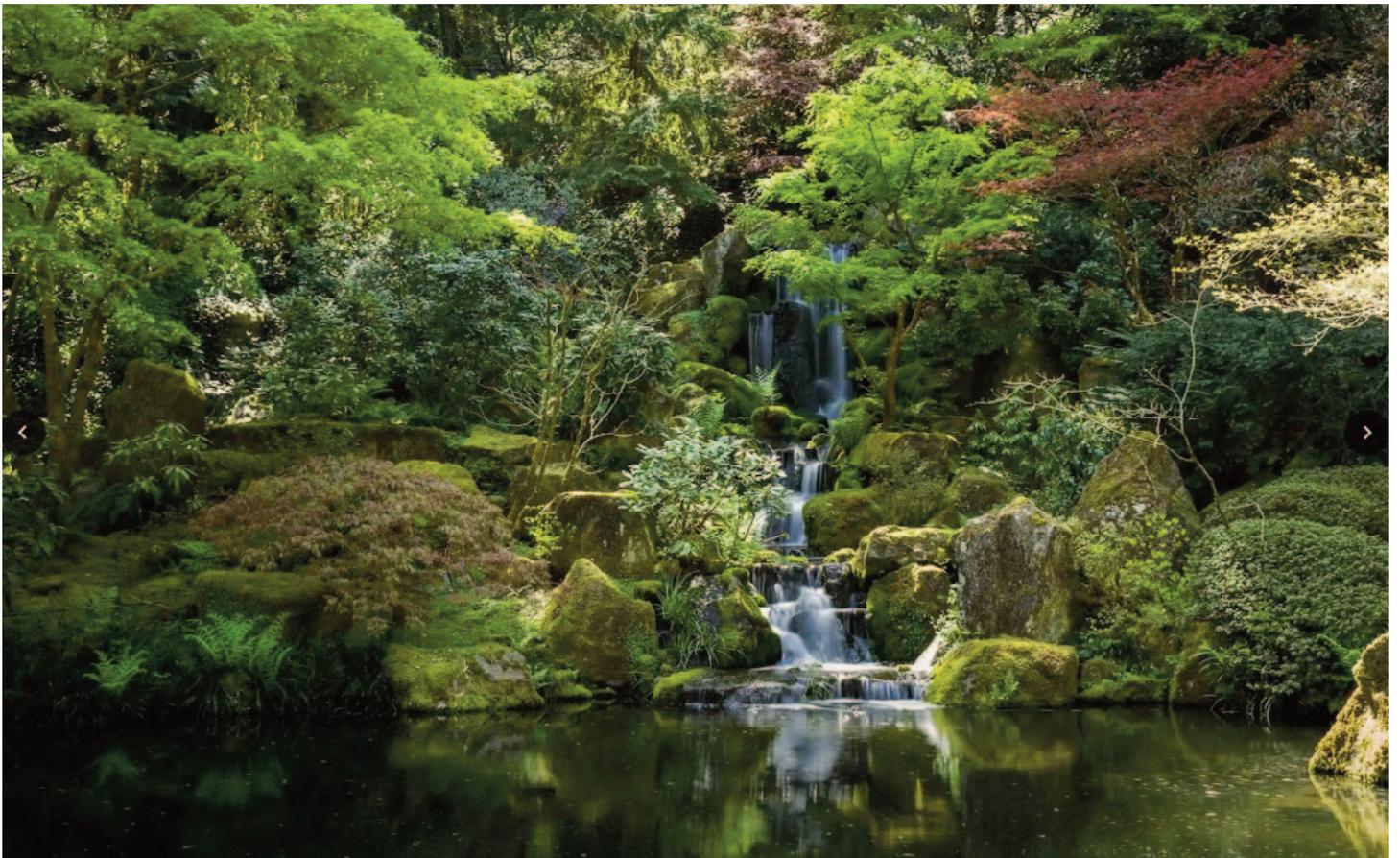
Conference sessions addressed the ways in which gardens harness both their individual and collective power to ignite connection, protection, and change. Presenters also highlighted the work of staff and volunteers in providing care and conservation capacity, and ultimately a better understanding of the natural world, impacting both humans and plants alike. Presentations and discussions also explored what new audiences, stories, and collaborations are missing in this important work.

Roots provides an overview of three colleagues who spoke at the American Public Gardens Association's 2022 Annual Conference, covering a range of issues including accessibility, art partnerships, and educational programming. All three talks were selected due to their unique learnings and the potential impact they could have on gardens globally. We hope you enjoy them.

Hoyt Arboretum Redwood Deck

CONGRESS

- American Public Garden Association: 2022 Annual Conference
- 19-24th June 2022
- Hilton Hotel
- CommUNITY of Gardens
- Portland, Oregon, U.S.



Creator David M. Cobb Portland Japanese Garden

CREATING A SUCCESSFUL ONLINE SCHOOL PROGRAM



The education team at the U.S. Botanic Garden faced a steep learning curve in understanding teaching in the virtual landscape. Presented with this opportunity, they created an engaging online school program. They have a powerful model to share with you.

1. Learnings from the Congress

There is no doubt that we are better together. Each of us within our own organizations realizes the gifts our colleagues bring to our work. A national platform such as the American Public Gardens Association Annual Conference connects a network of educators and resources across our entire community. This year, employees from the United States Botanic Garden (USBG), including several of our Learning & Engagement team members, were able to attend and present at the 2022 American Public Gardens Association Annual Conference in Portland, Oregon. One salient theme threaded throughout this year's conference sessions was the idea of meeting audiences where they are. How can we as educators see our audiences not as pupils to be instructed, but rather as collaborators in learning? We saw wonderful examples of how this was manifesting across gardens, and we recognized how this theme applied to our own work. When we attend a conference like the Association's, we inevitably return inspired!

Above: Screenshot from video shown during the *Think Like a Botanist* virtual field trip. In the video, a USBG Gardener discusses the adaptation of carnivorous plants

The combination of the virtual field trip framework and this new shared facilitation practice has resulted in a powerful model for replication.



Students in a classroom experiencing a virtual field trip

We were humbled by the willingness of our peers to share their challenges, successes, and models for replication. Fellow educators have shared with us so generously, and we are always excited when we can reciprocate by sharing our own resources. During our Association conference workshop, we shared an online school program framework and facilitation practice we developed during the pandemic.

2. Our presentation

As hands-on educators at the USBG, the impact of the pandemic was profound. How could we reach the thousands of students we engage each year on-site through a virtual medium? How would we ensure students had access to plant science? We appreciated teaching online would have unique challenges. Unlike the in-person learning that typically occurred at the Garden, students would not have live plants and scientific tools at their fingertips. However, we challenged ourselves to ask just how close we could bring students to thinking like botanists. We focused on developing an offering that would encourage students to explore and discover through making observations, asking questions, and sharing ideas (Understanding Science, 2022).

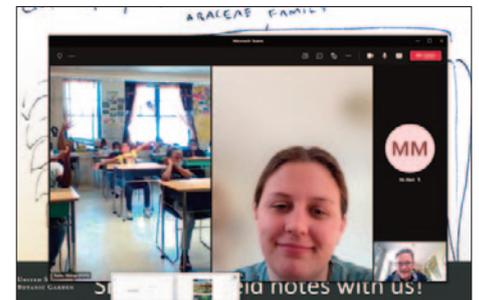
We recognized that moving online was an opportunity to build something new — the Garden’s first virtual field trip, Think Like a Botanist. Our intentions were for the lesson to be accessible to all schools, teachers, and students, to be learner-centered, and to incorporate the unique resources our Garden had to offer. As science educators, we knew we would design our activities at student engagement level. However, what we did not know was whether students would report the lesson as engaging.

Everything we did, from the images and the content selected to the facilitating practice, was intentional. Drawing on the BSCS 5E Instructional Model (Bybee, 2015) and The Teaching for Understanding Guide (Blythe, 1998) as initial instructional design frameworks, we mapped out the student experience one slide at a time. To assess prior knowledge, we invited students to share what they knew about plant parts and functions, allowing us to build toward the concept of plant adaptation. We asked students to go through the same process by exploring how plants have adapted to challenges in three different environments. Students started with the easy-to-conceptualize example of cacti in the dry desert before repeating the pattern with carnivorous plants in nutrient-poor bogs.

Finally, students were asked to apply their thinking by examining a rainforest plant and developing potential explanations for its adaptive traits. Once development was complete, we realized the framework of this virtual offering was strong, flexible, and adaptable and could be used to build future offerings. What also emerged was a new shared facilitation practice — a codification of how to successfully develop and facilitate an educational offering that invites participation and utilizes learner-centered engagement. The combination of the virtual field trip framework and this new shared facilitation practice has resulted in a powerful model for replication.

We were humbled by the willingness of our peers to share their challenges, successes, and models for replication. Fellow educators have shared with us so generously, and we are always excited when we can reciprocate by sharing our own resources.

Teacher evaluations confirmed what we hoped: students were engaged and immersed in the plant world.



USBG Intern facilitating Think Like a Botanist virtual field trip

“This field trip was absolutely the best! The presenter’s discussion, questions and content were fantastic and engaging!”

“Students were engaged and enjoyed the visuals and videos embedded in the lesson. The images helped scholars thoroughly understand the adaptation of plants.”

Teachers’ comment from virtual field trip evaluation

At the core of this facilitation practice are three educational strategies: invitation, content, and assessment. Invitations encourage student participation through open-ended questioning. Content conveys relevant information based on the lesson's core science concepts, students' foundational knowledge, and students' real-time responses. Assessments challenge students to actively demonstrate understanding. All three strategies move students toward the understanding goals of the lesson. As the lesson progresses, content decreases while invitations and assessments increase, allowing students to apply knowledge gained during the lesson and strengthen their critical thinking skills. The use of this facilitation practice creates a learner-centered experience.

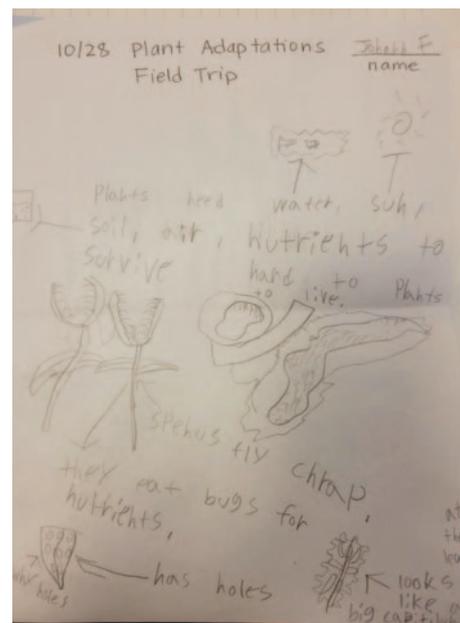
What surprised us? The *Think Like a Botanist* virtual field trip took us a year to build, but with this new framework, we were able to build unique lessons for three separate grade levels in two months' time. The shared facilitation practice allowed each of us to bring our teaching personalities to every lesson, keeping it fresh throughout the year with consistent, high-quality results. The student-centered approach meant each lesson was unique and adaptable to a new class each time. An intern with us for just a semester, when provided with the framework and time to learn the facilitation practice, was able to independently teach the virtual field trips within a matter of weeks.

Our virtual field trips were offered twice a day, three days a week. In the 2021-2022 academic school year, we taught 261 virtual field trips to more than 6,000 students. These numbers exceeded our expectations. We saw local schools who had never engaged with our on-site educational programming sign up for our virtual field trips. We tested our reach and offered virtual field trips to schools in several areas geographically isolated from botanic gardens. We saw a hunger for these resources across the country, and the virtual environment allowed us to meet audiences where they were.

As for student engagement, we recognized that students have different engagement preferences, and therefore we employed a variety of strategies. Students were able to respond to questions by calling out answers, pairing and sharing with classmates, and journaling. We included a captioned video of one of our horticulture staff members sharing their expertise on carnivorous plants. We used Google Maps Street View to bring students virtually through our Conservatory. We asked students to create their own field journal pages, making their learning visible. Teacher evaluations confirmed what we hoped: students were engaged and immersed in the plant world. These evaluations also revealed that we were not reaching the breadth of our intended audiences. As a result, we expanded from one lesson taught across three different grade levels, to three unique lessons geared toward grade-specific learning standards. As a result, we saw a more even distribution of grade levels participating in our virtual field trips. Expanding our offerings also revealed the strength and adaptability of our framework. Student field journals shared with us by teachers revealed that students were using observation and inquiry throughout the lesson to explore their ideas about plants and build on their ideas as the lesson progressed. We could see that even in the two-dimensional world of online learning, we were able to help students think like botanists!

In addition to sharing this framework at the 2022 American Public Gardens Association Annual Conference, in July we also shared it at the American Horticultural Society National Children & Youth Gardening Symposium in Richmond, Virginia. And now, we want to share it with you!

Please reach out, and we will share our virtual field trip slide deck and the framework guiding document for you to apply to your lessons and offerings. We invite you to join one of our virtual field trips alone, with colleagues, or even with some students.



Student's field journal page from one of our *Think Like a Botanist* virtual field trips

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LIGHTS, CAMERA, ACCESS: PRESENTING AT APGA ON KNOW BEFORE YOU GO VIDEOS (KBYGS)

Accessibility Educator, Katie Samson, shares her first-time experience attending and presenting at the American Public Garden Association's 2022 annual conference: CommUNITY of Gardens, June 19-24, 2022 in Portland, Oregon. Learn how both the conference and her session explored the themes of inclusion, diversity, equity, and accessibility (IDEA) and welcoming new audiences to Public Gardens.

1. Learnings from the Congress

Attending the APGA'S 2022 annual conference was a wonderful and enriching opportunity for many new and regular attendees. Under the theme, CommUNITY of Gardens, sessions addressed the ways in which Public Gardens harness individual and collective power to ignite connection, protection, and change. Staff and volunteers provided respite, care, conservation and a better understanding of the important relationship and connection between plants, animals, and people. The conference explored Inclusion, Diversity, Equity and Accessibility (IDEA) themes and collaborations that have often been missing and not always in the forefront in Public Garden spaces and programs (APGA, 2022).

Having not had the opportunity to attend a congress since 2019, over 700 attendees joined together in person and virtually in Portland, Oregon, to discuss how public engagement is more inclusive and diverse in gardens. Daily field trips throughout the city and conference sessions showcased such efforts by participants. I am the Director of Education for Art-Reach, an art service organisation based in Philadelphia, Pennsylvania, and I am a disabled self-advocate. Our team creates, expands, and advocates for accessible and inclusive opportunities for art museums, theatres, historic sites, and public gardens. Public gardens saw tremendous audience growth while navigating changing health guidelines during the pandemic; they became and continue to be stress relieving, safe havens during uncertain and challenging times. Attendees embraced the opportunity to reconnect with one another and build knowledge in key areas. Conference session topics included garden management, education and science, facilities and operations, horticulture, plant curation and conservation, and public engagement.

Top: A birding group from the Pennsylvania Center for Adaptive Sports benefits from the information shared and return to the garden every season (Joan Wheeler)



Katie Samson sharing a smile with fellow attendees at the APGA Conference (Pictures Courtesy of APGA; photography ©ThomasBollinger.com)

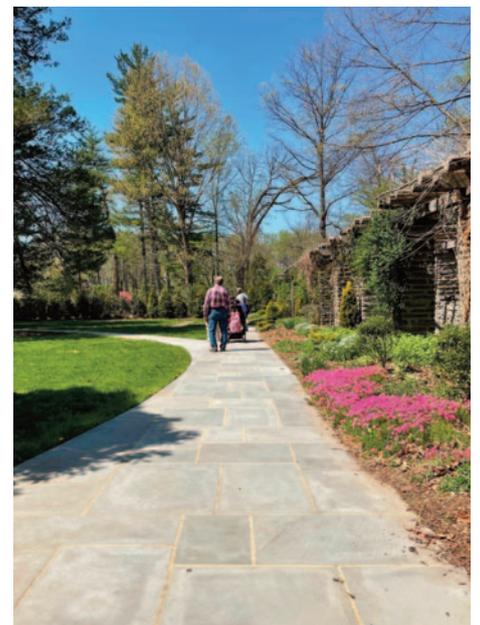


Communal learning and reflecting occurred at keynote and plenary luncheon sessions. The IDEA Center for Public Gardens, a partnership between the Association and Denver Botanic Gardens, launched in 2022, showcased a panel of guest speakers. I had the privilege of joining fellow panellists, Colah B. Tawkins, creator, producer and voice behind *Black in the Garden* podcast and Rev. Dr. Randy Woodley, a farmer, scholar and co-sustainer of Eloheh Indigenous Centre for Earth Justice and Eloheh Farm & Seeds, a regenerative teaching centre and farm in Yamhill, Oregon. The IDEA Center's Director, Mae Lin Plummer, hosted the discussion about identity, belonging, and our lived experience of marginalisation. Collectively we agreed that APGA can build better awareness about social justice, encourage diversity, inclusion and empathy; we discussed our collective thoughts about a path forward. As Colah B. Tawkins said, "You must start somewhere, and you have to make the mistakes. If you know you are already uncomfortable then lead with that. Admit that you don't have all the answers and that you are willing to learn." Sessions throughout the week expressed a desire for more work to be done.

It is clear from questions, responses, and requests for advice that Garden communities are eager for more support in building future IDEA committees, policies, procedures, and practices. There were conversations about hiring a more diverse garden community, reflections on racism, colonialism, and ableism with the recognition of responding to community needs. I felt supported and encouraged by many attendees as a wheelchair user and a person who is hard of hearing, and eager to continue the work.

Let us go beyond physical accessibility and address sensory and cognitive accessibility. Gardens may have designated sensory garden spaces, but have they built audiences and activated those spaces for those who could benefit the most? Neurodiverse communities, people with dementia, and/or people who are blind/low vision all have increased health benefits from horticultural engagement (Etherington, 2012). Over a packed week, APGA cultivated an eagerness to dig deeper into IDEA work, create moments of organisational reflection and welcome new audiences.

IDEA Café Panel and Lunch of Day four of the APGA Conference
(Picture Courtesy of APGA; photography ©ThomasBollinger.com)



A visitor in a wheelchair and family members walking along the accessible path at Stoneleigh- a natural garden
(Katie Samson)



2. Our presentation

To guide public gardens in best practices to welcome new audiences, I was thrilled to present my experience and a case study title: Lights, Camera, ACCESS Creating Know Before You Go Videos to better welcome visitors with disabilities. This 30-minute session addressed three major questions: why are these videos important for building audiences, who benefits? and what are the key steps to making a video? Often exclusionary practices are unintentional, such as a garden sharing basic and minimal physical accessibility information, but nothing else. This results in mistrust from the disability community. Embedding accessibility information along with general information about a garden brings a level of ease and comfort and takes the guess work out of a visit.

Planning a trip to a new place can be overwhelming and stressful. To alleviate that anxiety, we do our homework, use “the google”. You might prepare with picking up a book from the library, reading about a famous garden, and even learning bits of foreign language. This behaviour is akin to priming and it has been well researched by occupational therapists for over thirty years to assist people with autism and other forms of neurodiversity to better prepare for new forms of community engagements (Koegel, 2003). Author Amy Seeley writes, “Priming does not need to be overly complicated, but it must address the specific needs of the learner. It is a proactive, simple procedure that can be used by many to prepare for upcoming events or activities” (Seeley, 2015).

Social narratives are primers produced for parents and caregivers to share with a neurodivergent visitor prior to an experience. Many excellent examples already exist in public gardens such as: Longwood Gardens (<https://longwoodgardens.org/visit/accessibility>), US Botanical Gardens (<https://www.usbg.gov/accessibility-usbg>), and The New York Botanical Gardens (<https://www.nybg.org/visit/access/>). Know Before You Go videos (KBYGs: vernacular “K-Bugs”) were initiated for the arts and cultural sector in Philadelphia in 2017 in collaboration with the Greater Philadelphia Cultural Alliance, their Teen Council, Art-Reach and a small group of Museums. Many iterations have come from this initial program, but at the core, KBYGs are a three-minute introductory video, inclusively designed for all visitors, that make welcoming a priority and sets a visitor up for a successful experience. Ethan Kauffman, Director of Natural Lands’ Stoneleigh: A Natural Garden says, People with disabilities almost always must research new venues to make sure they are accessible before visiting.

A live performance took place at Lan Su Chinese Garden, one of Portland’s greatest treasures and one of the most authentic Chinese gardens outside of China (Pictures Courtesy of APGA; photography ©ThomasBollinger.com)

“You have to start somewhere, and you have to make the mistakes. If you know you are already uncomfortable than lead with that. Admit that you don’t have all the answers and you are willing to learn.”

Colah B. Tawkins

REFERENCES

- Anon., 2021. Visiting Stoneleigh: a natural garden. 2021(Pennsylvania): <https://www.youtube.com/watch?v=Psaw1Fv5qzc>.
- APGA, 2022. American Public Garden Association Annual Conference. [Online] Available at: <https://publicgardens22.dryfta.com/index.php>
- Berne, P., 2015. Disability Justice- a working draft. [Online] Available at: <https://www.sinsinvalid.org/blog/disability-justice-a-working-draft-by-patty-berne>

Even after multiple phone calls and online inquiries there can be unpleasant surprises upon arrival. Art-Reach's Know Before You Go videos put all of the important access information in one place in an easy-to-understand format so that our guests know exactly what to expect when they get here." (Anon., 2021)

KBYGs benefit many groups beyond people with disabilities: teenagers, accustomed to YouTube and Tik-Tok, senior citizens, who require captioning or audio support, as well as tourists, and local visitors. Layering in accessible features to videos also recognizes marginalised communities who have previously been left out of marketing content. Placing a window display of a sign language interpreter, embedding captions in a video, and creating a version with an audio description benefits the Deaf community, people who are hard of hearing, and blind and low vision visitors. When potential new audiences see themselves reflected in content and have effective communication displayed, they start to make connections that a garden, intentionally wants them to feel welcome.

A KBYG video can include information a visitor should know before they arrive such as multiple methods of transportation, parking and entrances. Depicting a clear picture of the admissions area, perhaps a uniformed employee and a visitor going through that process is helpful. Covering important aspects of human needs such as a restroom, water fountain, private areas for a nursing parent, and places of rest (benches) are just as valuable as information about the flora and fauna. The steps involved in creating a KBYG begin with a walk through outline, such as the case I presented on Stoneleigh - a Natural Garden in Villanova, PA with a self-assessment guide. The next steps, depending on your budget, involve hiring a videographer or partnering with a local graduate school media department to create a shot list for each section and a script that flows through the video. Recruiting patrons, volunteers, and people from the disability community to be involved in the "making" adds authenticity and representation. Many opportunities exist to engage in new community partnership with disability-centered organisations to build and create inclusive content. Once the video is edited and made accessible, gardens can place it on their website and post it to social media.

Media Relations Manager, Mae Axelrod said, "Our "Visiting Stoneleigh: a Natural Garden" video allowed us to apply one of Natural Lands' core values, nature for all, in practice." It was humbling and reassuring to receive positive feedback, encouragement as well as many inquiries from new and veteran APGA members after the session. Organisations acknowledge a key principle of disability justice when they focus on the disability experience - collective access and the credence of the disability rights movement "Nothing about Us, without Us" (Berne, 2015). I look forward to future collaborations with public gardens around the world.

*"Nothing about Us, without Us"
Berne, 2015*

REFERENCES CONTINUED

Etherington, N., 2012. Gardening for Children with Autism Spectrum Disorders and Special Education Needs. London: Jessica Kingsley.

Koegel, L. et al, 2003. Priming as a method of coordinating educational services for students with autism. Language, Speech, and Hearing Services in Schools 34, pp. 228-235.

Seeley, A., 2015. Priming 101: Help Your Loved one with ASD Succeed in new Situations. [Online] Available at: <https://www.autismsociety-nc.org/priming-101-help-your-loved-one-with-asd-succeed-in-new-situations/>

KBYGs are a three-minute introductory video, inclusively designed for all visitors, that make welcoming a priority, alleviate the unknowns of coming to a place for first time, and sets a visitor up for a successful experience.

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PUBLIC GARDEN PROGRAMMING FOR PROFESSIONAL AUDIENCES



Horticultural professionals have far-reaching impacts on environmental quality and the resilience of our landscapes. Public gardens experienced in providing gardening education are well-positioned to elevate their public programs to professional-level training that utilize staff expertise, improve environmental outcomes, and showcase our gardens as demonstration sites for sustainable practices.

1. Learnings from the Congress

The American Public Gardens Association’s annual conference was held June 20–24, 2022 in Portland, Oregon. This year’s conference theme was CommUNITY of Gardens, and as described on the conference website, sessions were aimed at addressing “the ways in which gardens harness both their individual and collective power to ignite connection, protection, and change. How the work of staff and volunteers provides respite, care, conservation, and a better understanding of all living beings, to both humans and plants alike. And lastly, to explore what new audiences, stories, and collaborations have been missing in this important work.”

I attended the conference both to highlight some exciting work I have been involved with at my home institution and to find inspiration and ideas for new initiatives. I was most interested in learning how gardens are creating public value and making an impact in their communities beyond the garden gates. This is something we are actively exploring at UW Botanic Gardens and I was eager to hear how other gardens were approaching community engagement.

This theme was at the forefront during a special lunchtime Inclusion, Diversity, Equity and Access (IDEA) Café focusing on Identity. Speakers shared stories from diverse identities and discussed how their unique perspectives influence the work they do in our field.

Above: Instructor Christina Pfeiffer teaches a ProHort class on seasonal plant identification and landscape management in the UW Botanic Gardens’ Washington Park Arboretum (Jessica Farmer)

Public gardens are well-positioned to elevate their public programs to professional-level training that utilize staff expertise, improve environmental outcomes, and showcase our gardens as demonstration sites.



Serving our audiences and the broader community more equitably is a priority for me in my work, and at the conference I learned about ways to employ ethnobotany and storytelling in the garden to connect more deeply with different audiences. I also heard presentations about accessibility for people with disabilities and how we can improve our programs, tours and signage to be more welcoming to all.

I was inspired to hear about fabulous community Food Festivals hosted at Atlanta Botanical Garden and Madison Square Park Conservancy, and have been thinking about how we might create a similar event at our UW Student Farm. I learned about models for leadership and job training programs like the Apprenticeship Program organized by American Forests and the Learning by Leading program at the UC Davis Botanic Garden and Arboretum. These examples offer established templates for developing successful programming at our institution.

It is always such a treat to connect with colleagues from other gardens at the conference, to learn about all the exciting work being done in the field, and to renew my sense of wonder and excitement for future possibilities.

2. Our presentation

Our planet faces complex environmental challenges related to climate change, pollution, and pest and disease pressures – many of which are exacerbated by conventional landscape management practices. Gardens are uniquely positioned to deliver educational programming that reframes the conversation on sustainable landscape practices. But to achieve maximum impact, we must go beyond offering classes for home gardeners and focus attention on educating professional audiences, from landscape designers and maintenance crews, to property managers and homeowners associations. And to reach these audiences, we need to forge innovative partnerships with a community of professional associations, governmental agencies, and nonprofits.

Students learn about plant selection and design in Allen Centennial Garden's course on Design and Management of Resilient Landscapes (Ben Futa)

I was most interested in learning how gardens are creating public value and making an impact in their communities beyond the garden gates.

To achieve maximum impact, we must go beyond offering classes for home gardeners and focus attention on educating professional audiences.

In this session, “Programming for Professional Audiences: Leveraging Partnerships to Maximize the Impact of Gardens’ Educational Programs,” I shared the stage with Britt Patterson-Weber, Vice President of Education & Interpretation at Naples Botanical Garden, and Ben Futa, former Executive Director, Allen Centennial Garden, University of Wisconsin-Madison.

Our session aimed to convey the broad environmental impacts achievable with training professional audiences, like Naples Botanical Garden’s lake and pond management workshops developed with regulatory and research partners to address water quality impacts of landscape practices. These workshops utilize the garden’s onsite stormwater treatment systems as a teaching campus and physical demonstration of the principles shared in the workshops.

We discussed how gardens can showcase in-house staff expertise by offering technical training delivered in a variety of formats, including pruning certification series, soil science webinars, immersive workshops on planting design and management, and hands-on advanced field instruction for arborists. Working across departments in your garden, education staff can develop an understanding of what strengths and expertise your staff can offer. The horticulture and arboriculture staff at your garden can also help define the educational need by sharing what challenges they’re experiencing in the field. With the longevity of public garden collections, and the focus on care and recordkeeping over time, staff can often tell stories that can inform better practices in the professional field, sharing things they “learned the hard way” or wish they’d known sooner.

All our panelists highlighted the value of establishing programming partnerships with entities who have shared missions and aligned goals. These partnerships leverage both subject-matter expertise and organizational capacity, like UW Botanic Gardens’ annual symposia where speakers present new research and best practices for both professionals and hobby audiences, creating a robust cross-pollination and exchange of ideas, concepts, and applications of lessons learned. These symposia are developed in partnership with professional stakeholders and span the fields of landscape design and management, regional botany, and urban forestry. I highlighted one of our most successful and in-depth professional training programs serving ecological restoration professionals, developed in partnership with the Northwest Chapter of the Society for Ecological Restoration. We leverage expertise from our partners and a professional steering committee to guide program content, and the Gardens contribute our educational programming capacity and on-site living laboratory.

Lastly, we emphasized that training for professional audiences can bolster your education program’s bottom line! Collaborators from large organizations and government agencies can bring grants, contracts, and sponsorship dollars to support training with positive environmental outcomes. Professionals often have financial support from their employers to attend training that build technical skills and contribute toward acquiring and maintaining professional certifications.

I encourage anyone embarking on the development of professional programming to actively bring diverse voices to the planning table. Our programs have benefitted from the involvement of folks from all different stages of their careers, perspectives from public, private and nonprofit representatives, and voices from Tribal governments, professional associations, and community-led efforts. I suggest developing written agreements to bring clarity to roles and expectations. Work hard to be a good listener, with your partners and the community you are serving, to truly understand how to best meet the educational need. And be generous with your time and resources when undertaking a new programming effort. Taking the time to invest in relationship-building up front will result in well-rounded programming that meets community need and has the greatest positive impact on our environment.

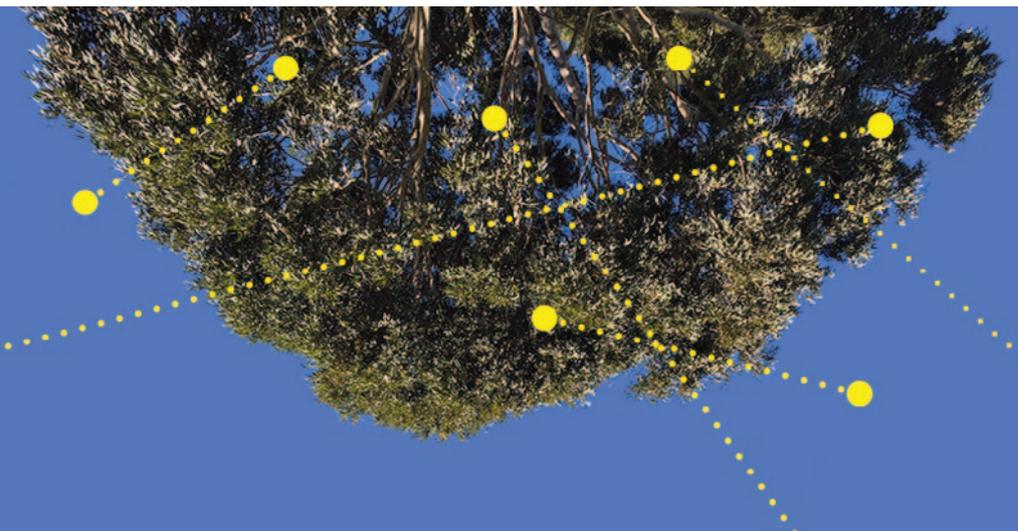
I encourage anyone embarking on the development of professional programming to actively bring diverse voices to the planning table.



The Naples Botanical Garden’s award-winning stormwater treatment system serves as a case study in their urban lakes and ponds workshop (Britt Patterson-Weber)

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OVERVIEW OF THE 7TH GLOBAL BOTANIC GARDEN CONGRESS

The theme this year was Influence and Action: Botanic Gardens as Agents of Change. Participants explored how botanic gardens can play a greater role in shaping our future. With accelerated loss of biodiversity across the globe, increased urbanisation, population growth and climate change, the need to work together to find new solutions for the future had never been greater. From the moment the Congress started, there was a true buzz about creating change and the need for acting now!

Due to the cancelling of the 11th International Congress on Education in Botanic Gardens, there was also a bigger focus on education, dedicating a full day to outdoor hands on workshops and continuing this theme throughout the rest of the Congress.

In the education and engagement theme there were 18 workshops, seven tours, two panel discussions and 18 oral presentations over four days covering a variety of topics; from measuring online engagement effectively to biomimicry, led by multiple gardens. A strong theme of climate change and sustainability was present in many of the gardens activities and together gardens discussed the challenges overcome and agreed how we can have a greater impact on our future visitors.

Important Lessons that came out of the education and engagement theme included:

- Botanic gardens around the world are being activated as spaces for all members of our community.
- Garden staff and educators inspire people and culture change through our learning landscapes and creative programming.
- Local and global networks increase our impact.
- Whatever your expertise, make us stronger and we are all educators and agents of change.

Calls to action around this theme included:

- Staying connected and inspired. - BGCI is exploring how we can support an Education and Engagement Network.
- The need to showcase stories of hope and co-creation in response to a changing climate.
- Continue to accept and adapt to uncertainty & change.
- Explore different knowledge systems truth, justice and reconciliation.

Below we highlight one of the presenters of the education day from Behaviour Works who is looking at how we can change visitor attitudes.

Sunday 25th September to Thursday 29th September BGCI, The Royal Botanic Garden of Victoria and Botanic Garden Australia New Zealand Network (BGANZ) hosted the 7th Global Botanic Garden Congress in Melbourne. Delayed due to covid, it was great to see representation from over 500 delegates from 36 countries. All of them coming together and shaping the future of botanic gardens.

Above: Global Botanic Garden Congress Poster

CONGRESS

- 7th Global Botanic Garden Congress
- September 2022
- Royal Botanic Gardens Victoria
- Influence and Action: Botanic Gardens as Agents of Change
- Melbourne, Australia

BEHAVIOURAL SCIENCE FOR SUSTAINABILITY: EFFECTIVELY INFLUENCING CHANGE

Gardens can apply behavioural science tools and techniques for more impactful sustainability programs. We start by identifying our audience, our priority behaviour ('Who needs to do what, where and when') and program designs to make the behaviour EASY to do, ATTRACTIVE for our audience, SOCIALLY supported by others and TIMELY.

1. Learnings from the Congress

The 7th Global Botanic Gardens Congress was stimulating, inspiring, thought-provoking and fun. From my perspective, as a returning member of the botanic garden sector and behavioural scientist, the congress topics seemed to cover two main areas:

1) Demonstrating the need for action across sustainability challenges

Illuminating and sobering keynote presentations from Cristina Lopez-Gallego (University of Antioquia), Professor David Karoly (University of Melbourne) and Professor Michelle Leishmann (Macquarie University) respectively discussed the global situation regarding assessing and protecting plant diversity, the impact of carbon emissions on increasing land temperatures, and the need to use our understanding of changing climates to strategically plant for landscape species selection. Dr Paul Smith drove the point home, making the case for conservation horticulture, not just to protect biodiversity but to provide an acceptable and appropriate alternative to monoculture carbon sequestration tree plantations. These sessions certainly validated our need to take action; the other main theme illustrated the multitude of creative ways in which the botanic garden sector is doing just this.

Congress participants at the poster presentation - the two BWA posters on avoiding assumptions and the five key principles of behaviour change (S. Kneebone)

“The World Meteorological Organisation reported that the global average temperature in 2019 was 1.1°C above pre-industrial levels. But ‘most people are not fish – we live on land’. In Australia, average land temperatures have risen by 1.5–1.6°C in only 70 years.”
Professor David Karoly, University of Melbourne



2) Addressing these challenges through influence for action

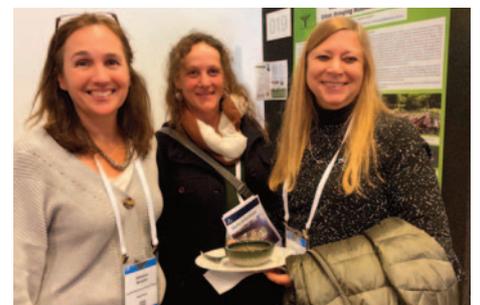
The stories of influencing action from gardens and colleagues around the world were diverse, inspiring and energising. Serges Verlain (Limbe Botanic Garden) discussed the impact of the new Integrated Conservation Education Centre in welcoming residential groups for plant conservation education and action. Amy Padolf (Fairchild Tropical Botanic Garden) described their BioTECH High School, a botany and zoology focused school running over three campuses and welcoming 400 students per year, and the 'Million Orchid' project that has reintroduced 450,000 native orchids across Southern Florida. Laura Skates (Kings Park and Botanic Garden) shared how the 'Friends of' volunteer program raise \$200,000 annually through native plant propagation and sales, supporting native gardening efforts across Perth. Adriana Burgos (Jardín Botánico Carlos Thays) outlined their ecological restoration program and the role it plays in engaging visitors with the environment. Sally McPhee (RBG Victoria), John Arnott (BRG Cranbourne) and colleagues described the innovative 'Care for the Rare' program, connecting six regional botanic gardens to grow and showcase a multi-site plant conservation collection. Jeff Downing (Mount Cuba Centre) shared how strategic signs and selection of 6-8 seasonally attractive native species led to 29% of visitors buying an average of two plants each at the end of their visit! Rebecca Stanley (Auckland Council) provided a fascinating overview of the threat invasive species pose to New Zealand ecosystems, and the practical, focussed, removal program 'Pest Free Auckland' supporting community audiences on three priority behaviours (pull a weed, set a trap, plant a tree), demonstrated to have a beneficial impact on biodiversity. In a fascinating session, Sharon Willoughby (RBG KEW) emphasised that botanic gardens have a legitimate role in behaviour change and that visitors expect gardens to play such a role.

These two congress themes really brought home to me the incredible task that botanic gardens, with limited financial and personnel resources, but copious amounts of passion, enthusiasm and drive, are trying to achieve. Across the network there is strength in collaboration, sharing ideas and successes. However, the sheer scale of the challenge means gardens could benefit from partnership, capacity building and support from outside the sector to maximise the impact and efficacy of action-oriented programs. Specifically, gardens can make the most of existing research, and evidence-based frameworks, tools, and knowledge around what works to encourage behaviour change in their visitors.

John Arnott, Curator of Royal Botanic Gardens Cranbourne, describing the innovative 'Care for the Rare' program (S. Kneebone)



BGCI's Abby Meyer leading an interpretation strategic planning discussion (S. Kneebone)



Some of the Argentinian congress contingent, including the inspirational Adriana Burgos (l) and the incredible Marcela Sanchez (r) (S. Kneebone)



The author with some of BGCI's hard working team members!

“Over 70% of all Australia’s registered weeds started as home garden plants. Around 1000 plants and animals are directly threatened by invasive weeds.”
Professor Michelle Leishmann, Macquarie University

2. Our presentation

To this end, my workshop and presentation, and the education keynote by Professor Liam Smith, BehaviourWorks Australia (Monash University) explored the possibilities to increase program impact and efficacy of change-focussed interventions, by incorporating learning from behavioural science. We focus on behavioural science because people’s behaviours, rather than their attitudes or beliefs or values, actually create an impact to make a tangible difference to the sustainability challenges we are trying to address. Behaviours are observable actions, something we can SEE happening (and count!), such as ‘Selecting the meat-free meal option’ rather than outcomes or intentions, such as ‘Reducing meat consumption’ or attitudes, beliefs and knowledge, such as ‘Going meat-free helps protect the environment’.

To address a problem, we first describe our target audience, the group we want to engage with, who they are, where they are from, what things they care about, what behaviours they currently enact, and so on. Then we identify desirable behaviours, things we want people to START doing, rather than stop, and define behaviours very precisely, answering the question ‘Who does what to what, where and when?’ (Kneebone et al., 2021). This is because the drivers and barriers which influence behaviour adoption, will change according to the location and time as well as the action itself. So, we would say ‘The staff member selects the meat-free meal option, at the garden cafe, at lunch time’, or ‘The visitor buys a reusable water bottle at the shop at the start of their visit’.

Complex sustainability issues lend themselves to multiple different behavioural solutions, for example a study on household water conservation identified 144 water saving behaviours (Kneebone et al., 2017). Providing visitors with long lists of sustainability behaviours can be problematic; we risk overwhelming visitors, leaving them paralysed by choice and unable to act (Schwarz & Ward, 2004) or else transfer the responsibility of selection to our visitors, resulting in only those behaviours that are easiest to perform, rather than those which are most effective. This may preclude achievement of the significant impact we so urgently need (Gardner & Stern, 2008).

We can use a prioritisation tool, such as NERO (Smith et al., 2010), or the Impact-Likelihood Matrix (Kneebone et al., 2017), to select a target behaviour. NERO was developed by asking zoo visitors about their preferences for pro-environmental actions. Visitors preferred behaviours that were NEW or if known, include new learning that underpins why they are needed; EASY to do; had high RESPONSE EFFICACY (i.e. a clear link between the behaviour and how it helps wildlife) and ON-SITE, so visitors can perform the behaviour whilst they are at the zoo. Given the commonalities between the sustainability aims and visitor profiles of zoos and botanic gardens, this tool could be used by gardens to aid the selection of target behaviours to form the basis of particular projects, programs or campaigns.

Planning for behaviour change

To increase the efficacy of behaviour change programs, we use an evidence-based framework to answer six key questions that we use to shape the design of behaviour change interventions.

1. *What is your problem?*
2. *Who is your target audience?*
3. *What behaviours could address your problem?*
4. *Which behaviour is your priority?*
5. *What are the drivers (to support) or barriers (to overcome) that affect whether your audience performs the priority behaviour?*
6. *How can I make the behaviour EASY, ATTRACTIVE, SOCIAL and TIMELY?*



Keynote Rebecca Stanley from Auckland Council, presenting on their ambitious invasive species eradication program (S. Kneebone)



Delegates enjoying the day at RBG Victoria (S. Kneebone)

Once we have a priority behaviour selected, we can focus our (usually limited!) resources on supporting visitors to engage with the behaviour. If we are unable to investigate the drivers and barriers that influence this behaviour for our specific audience in detail, we can use generic behaviour change tools to help inform program design. The EAST framework, developed by the U.K. Behavioural Insights Unit (2014), provides useful guidance. First, (and most importantly) make your behaviour EASY to perform, by simplifying processes or the language used; ATTRACTIVE to your audience, making it relevant to them or using incentives; SOCIAL by illustrating norms or using influential spokespeople; TIMELY, by connecting it to current events or campaigns. The BIU EAST guidelines are available online and provide more ideas of how these criteria can be applied (BIU, 2014).

To summarise, human behaviour is at the heart of many of the greatest challenges faced by society today, particularly those topics faced by botanic gardens. An understanding of behavioural science can unlock opportunities to meet these challenges and successfully implement the Sustainable Development Goals. BehaviourWorks Australia, with Monash Sustainable Development Institute and the SDG Academy, has created a FREE online course, 'Changing Behaviour for Sustainable Development'. The 6-module, fully online course is self-paced and available at any time. Topics include systems thinking, behaviour prioritisation, drivers and barriers of behaviour, intervention design and evaluation, ethics, and more, illustrated by practical case studies. The program is designed to provide a foundational overview of how behavioural science can be harnessed to create influence and action for sustainability.

Enrol now for FREE at sdgacademy.org/course/changing-behaviour-for-sustainable-development/ for practical, evidence-based tools and ideas.

Curious about a behaviour change framework? Access our FREE online book, behaviourworksaustralia.org/resources/the-method-book, as a guide to project planning for impactful change.

Stay in touch! Sign up to the BWA Broadcast to get the latest in behavioural science news behaviourworksaustralia.org/sign-up

REFERENCES

- Behavioural Insights Team (U.K) (2014). EAST. *Four Simple Ways to Apply Behavioural Insights*. www.bi.team/publications/east-four-simple-ways-to-apply-behavioural-insights/
- Gardner, G. T., & Stern, P. C. (2008). The short list: The most effective actions US households can take to curb climate change. *Environment: science and policy for sustainable development*, 50(5), 12-25.
- Kneebone, S., Smith, L., & Fielding, K. (2017). The Impact-Likelihood Matrix: A policy tool for behaviour prioritisation. *Environmental Science & Policy*, 70, 9-20.
- Kneebone, S., Boulet, M., Jungbluth, L., Downes, J., Klemm, C. (2021) Getting ready to deep dive – Defining, identifying and prioritising behaviours. Chapter 5, *The BWA Method* behaviourworksaustralia.org/the-method-book/chapter-5-defining-identifying-and-prioritising-behaviours
- Schwartz, B., & Ward, A. (2004). Doing better but feeling worse: The paradox of choice. *Positive psychology in practice*, 86-104.
- Smith, L., Curtis, J., & Van Dijk, P. (2010). What the zoo should ask: The visitor perspective on pro-wildlife behavior attributes. *Curator: The museum journal*, 53(3), 339-357.

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CONTRIBUTE TO THE NEXT ISSUE OF ROOTS

The next issue of Roots is about **Accessible Interpretation**. Now more than ever it is important that our information is open and accessible to all, especially as 15% of the global population have an additional need. We are looking for articles from gardens and other educational sites looking at their interpretation to make their visitor and education offer more accessible.

We are currently looking for a variety of contributions including articles, education resources and a profile of an inspirational garden staff member.

To contribute, please send a 100-word abstract to helen.miller@bgci.org by 10th January 2023



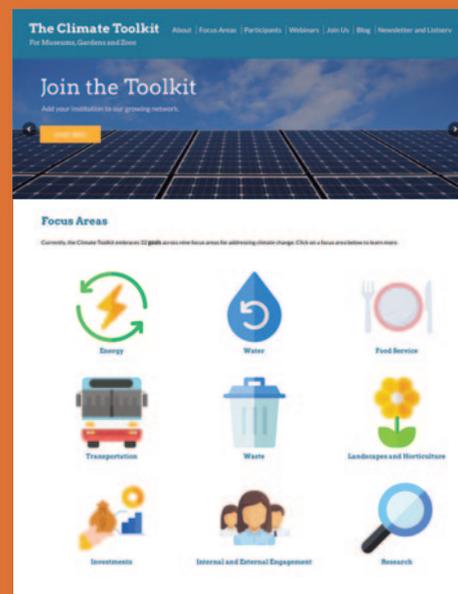
THE CLIMATE TOOLKIT

Sign up and join 60 gardens on The Climate Toolkit!

The Climate Toolkit is a collaborative opportunity for museums, gardens and zoos who want to learn how to aggressively address climate change within their own organizations and inspire the communities they serve to follow their lead.

Currently, The Climate Toolkit embraces thirty-two goals for addressing climate change within the categories of energy, food service, transportation, plastics, landscapes and horticulture, investments, visitors and research. The goals were determined through a collaborative process with input from members of the Directors of Large Gardens group. The goals will evolve based on member input over time; submissions are encouraged of updates about any climate-related efforts – whether from the existing goals list or beyond – from all participants.

<https://climatetoolkit.org/>

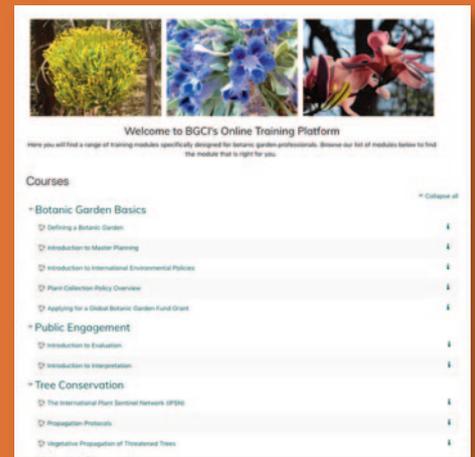


BGCI'S ONLINE TRAINING PLATFORM

BGCI has an online training platform which offers training courses to BGCI members and other interested individuals. The platform allows the creation of a range of interactive content with resources designed to complement BGCI's existing face-to-face training courses, projects and publications.

Modules include an Introduction to Interpretation, an Introduction to Evaluation and a Botanic Garden Basics series.

Find out more by visiting: <https://training.bgci.org/>

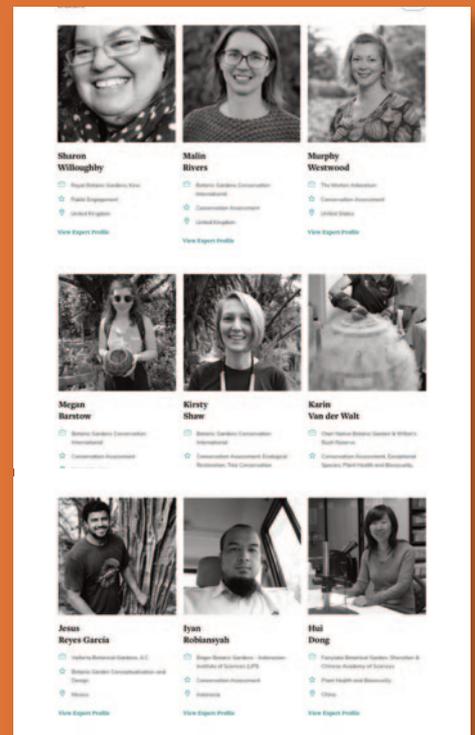


BGCI'S DIRECTORY OF EXPERTISE

BGCI's new Directory of Expertise is designed to enable experts within botanic gardens to let other people know about their own skills and knowledge and, if possible, help them to solve a problem or challenge related to botanic gardens or plant conservation. As a membership benefit exclusively for BGCI Institutional Members, staff associated with these institutions can apply to be listed in the Directory.

The Directory currently has 11 areas of expertise including Public Engagement. BGCI's purpose in creating this Directory is twofold: firstly, to share the knowledge and skills in the botanic garden community with broader society to solve problems or save plant species, and secondly to give staff of BGCI Institutional Members opportunities to broaden their experience and make a contribution that might not come their way in day to day work.

For more information or to be listed as an expert visit: <https://www.bgci.org/resources/bgci-databases/directory-of-expertise/>.





CALLS FOR EXPRESSIONS OF INTEREST TO HOST 11TH INTERNATIONAL CONGRESS ON EDUCATION IN BOTANIC GARDENS

BGCI is inviting pre-proposals from botanic gardens or arboreta interested in hosting the 11th International Congress on Education in Botanic Gardens (ICEBG) in 2025. The ICEBG held once every three years, is traditionally hosted by a BGCI botanic garden member, with Congress activities centred around the host botanic garden.

Where possible BGCI aims to reflect a broad geographical spread of Congress locations to encourage participation from around the world. Past Congresses have been held in Utrecht, The Netherlands (1991), Gran Canaria, Spain (1993), Brooklyn, USA (1996), Kerala, India (1999), Sydney, Australia (2002), Oxford, UK (2006), Durban, South Africa (2009), Mexico City, Mexico (2012), Missouri, USA (2015), Warsaw, Poland (2018). An education and engagement day was also included as part of the 8th Global Botanic Garden Congress in Melbourne Australia (2022) following the cancellation (due to the Covid pandemic) of the intended 2021 Education Congress in Argentina.

Botanic gardens or arboreta interested in hosting an international Congress with Botanic Gardens Conservation International in 2025 should submit a pre-proposal document to the **Secretary General of BGCI by 2nd December 2022**.

Requests for full proposals will be issued to interested gardens by 10th February 2023, together with guidelines on key criteria, and the proposal selection process.

For full details of what to include in the pre-proposals as well as the wider process please see the **BGCI_Education_Congress_guidelines 2022**.

