

Workshops

Elderly people: as preferred mediators for the younger generation?

Rémi Saxe

Conservatoire et Jardins Botaniques de Nancy, Nancy, France.

Preface

The 2002 survey 'Methods in caring for and looking after young children' (Langouët & Béraud-Caquelin, 2005) estimates that 2.5 million children aged less than 7½ years old have working parents; 80% of them have at least one parent who works irregular or unsociable hours. For these children there is an increased probability of being cared for during non-standard time periods, such as before 8am in the morning or after 7pm in the evening.

When French parents are asked about the principal method they use to care for their child (under 6 years old), 10.5% of them confirm they make good use of grandparents. This is the third most-preferred method behind stay-at-home mothers (46.9%) and accredited childcare (20.7%). According to the French National Old-Age Insurance Fund, 85% of women and 65% of men occasionally care for their grandchildren, sometimes after school, on Wednesdays (when school is closed in France), or during the holidays.

This type of care offers advantages for all members of the family. In a study by Audrey Daniel on 'Methods of looking after children under 6 years old' (Ruault & Daniel, 2003), parents put forward various reasons for preferring to use grandparents: geographical proximity, trust and the reassuring emotional relationship they can offer. And for a child, the 'similarity/difference' of grandparents is also very reassuring as they are obviously not strangers to them. This special relationship enables children, particularly the youngest ones, to open up to the world whilst retaining a feeling of security.

These periods of care are also highly beneficial for the older children. They will appreciate the contact with protective, available and often very patient, adults. When they are with Granny and Grandad, they also get the chance to do things they wouldn't necessarily do with their parents such as board games, going to a museum or the cinema, going to the market, making a tree house or cooking pancakes. All of these are activities which, although not particularly extraordinary, make holidays or afternoons unforgettable.

Aim of the activity

- To offer grandparents ideas for activities
- To increase knowledge about biodiversity
- To train grandparents to enable them to transmit a message
- To give fun solutions with a scientific message
- To offer an active role to grandparents
- To make use of the knowledge and cultural experience of grandparents.

Activity description

This activity takes place over the course of three sessions.

A specific timetable has been planned for this activity, which begins by meeting at 3pm in the Garden's welcome lodge (after a small siesta). The activity lasts for one hour. We felt a short duration was justified because elderly people perhaps have slightly less stamina and do not wish to divulge too much information. They must define the subject according to their knowledge, with the protection of biodiversity in mind. A choice of work and practical activities are offered to link in with the subject matter.

Each session has a different theme:

Chocolate, sugar and society

This first subject is a classic theme and is attractive to many people. Chocolate and sugar cane are tropical plants which are widely consumed but not very well known about. They are very attractive to children and grandparents alike.

The group gather in front of the cacao plant which at this time of year is in flower. After a description of the plant and the way it fruits, I highlight the ecological aspects of the plant. Our cacao plant is planted in a greenhouse which offers an environment similar to the undergrowth of a tropical rainforest. This enables me to explain the conditions which are essential to its development. It is also a good moment to mention tropical deforestation and its consequences as regards the loss of biodiversity. When it comes to the cacao plant, the aim of deforestation is to clear land. Cocoa-cultivation can be observed in large plantations, along with all the problems encountered when using monoculture growing methods. The solution could be to no longer eat chocolate unless, as I recommend, it is bought from fairtrade sources. Fairtrade enables producers to have a more stable revenue. Part of the profit goes towards developing the community and cultivation of cacao plants is more respectful of the environment due to agroforestry practices and the minimal or zero use of phytosanitary treatments.

The other plant talked about is sugar cane. Its cultivation is also a significant source of nuisance to the environment. Two solutions are proposed to visitors; fairtrade and the consumption of sugar produced in eastern France. Sugar beet has been grown in France since Napoleon's era. Beet produces only white sugar, used a lot in cake making for more fruity flavours. The use of organic sugar cane or fairtrade products is recommended.

I choose to pay only a short visit, which enables the audience to easily retain the small amount of information provided. To facilitate a dialogue with their grandchildren, I propose some practical activities.

A brochure published by 'artisans of the world' is on offer and games are proposed which are based on the theme of chocolate and mention the interest in fairtrade.

Cocoa beans are also handed out.

There are a few references to books, particularly small booklets with recipe ideas or activities using sugar.

There is also a game booklet on the theme of sugar and illustrated with a cartoon called 'Kanel'. The Kanel character is a little sugar cane, enabling different subjects relating to sugar cane to be explored such as the discovery of sugar, its cultivation, production, slavery and nutritional information.

Wild plants

The aim of this activity is make people aware of the diversity and richness of the local flora. To highlight this, I take the grandparents into the Garden and over the course of the walk, describe the plants we come across, explain the different uses of these plants (medicinal, food, etc), make them taste a few flowers while we are there and pick a few plants to use in a dish that I prepare. The activity ends with us making some doughnut dough, cooking a few doughnuts and then tasting them.



Cooking fritters of wild carrot flowers

*Visit on the theme of wild plants; here shown is the marigold *Calendula arvensis L.**

The idea of this visit is to show that a great number of plants are edible but you must be able to identify them. You also need to know how to pick plants without overexploiting them and jeopardizing their existence in nature. You must also pay attention to pollutants in the soil and the atmosphere when you are picking, so which plants you pick from is also an important issue. A recipe booklet is also offered to visitors.

Bergamot and pressed fruits

This activity aims to find out about the biodiversity of citrus fruits and also about a small part of our cultural biodiversity. Cultural biodiversity can be considered as an essential element of sustainable development.

The link between citrus fruits and our cultural biodiversity is a dessert fruit, 'the Nancy bergamot'. This fruit is one of the town's food specialities. Not much is known about this citrus fruit and yet it has been part of our local heritage since the 18th century.

The activity takes place around our collection of citrus fruits, using a written scientific story in the botanical garden called 'Bergamot and pressed fruits'. In this story, a bergamot journeys through the stalls in a market to find out about its family, citrus fruits. During the visit, I find all the citrus fruits described in the story, one by one. I explain the characteristics of each plant and how it is used.

A significant section is devoted to the bergamot tree and we have one which at the moment is in fruit. The ecology and origin of this plant is described as well as the history of the sweets that are a speciality of Nancy. Then I make some 'Nancy bergamot' desserts. The simple recipe can be carried out at home and a recipe sheet is given to each visitor.

At the end of the visit, the book 'Bergamot and pressed fruits', published by Nancy's Conservatory and Botanical Gardens, is offered to every grandparent.

Report and views

- I notice great interest from listeners with lots of questions from visitors.

- I receive lots of requests for documents so the activities can be reproduced elsewhere.
- Other activities with different themes are conceivable, for example, organic gardening.

References

Langouët, G. & Béraud-Caquelin, H. (2005). Les modes de garde ou d'accueil de jeunes enfants de 0 à 6 ans. In: *Observatoire de l'enfance* 82.

Ruault M., Daniel A. (2003). Les modes d'accueil des enfants de moins de 6 ans, In: *Etudes et resultants DREES*, n° 235.

Oman Botanic Garden: using generic learning outcomes to support education for sustainable development

Sarah Kneebone

Oman Botanic Garden, Sultanate of Oman

Abstract

Generic learning outcomes (GLOs) have been developed by the Museum, Libraries and Archives Council (MLA) in the UK. They apply learning theory to an exhibition and education environment. GLOs can provide a focus and a framework for the evaluation of learning outcomes, and ensure that all materials produced for public consumption are as effective as possible. They can be used as a tool to help analyse education work and discover its impact on individuals and communities, and design better learning experiences and spaces that inspire people to learn.

By identifying learning outcomes for exhibitions, interpretation or programme design, we are able to answer the following questions:

- What are people going to know?
- What skills will they pick up?
- How will their attitudes and values evolve or become more explicit?
- What will inspire them, and encourage their creativity?
- How will their behaviour change as a result of participating in this provision?

This workshop will introduce GLOs as a concept, outline how the Oman Botanic Garden has used GLOs in its interpretation design, and provide a framework for Congress participants to apply GLOs in their own programmes and interpretation. We will also discuss what kinds of GLOs botanic gardens can use to promote sustainable development.

Introduction to the Oman Botanic Garden

Oman Botanic Garden (OBG) is a 4.2 million m² (420 ha) facility currently being developed to conserve, display and research the plants and ethnobotany of Oman. The Garden will become a destination for local and international visitors as a centre for learning and recreation. Established by Royal Decree in 2006, it is the responsibility of the Office for Conservation of the Environment, part of the Diwan of Royal Court.

Oman Botanic Garden will bring habitats to life from all over Oman. Visitors will be able to experience the seasonal fog forests of Dhofar all year round, walk through baking sand desert, unique juniper forest, arid, salty Sabkha, dry gravel desert and beautiful wadis in one day in one place. All of Oman's plants, from the dramatic to the beautiful and the tiny will be on display among carefully created naturalistic habitats. An extensive nature reserve surrounding the constructed garden provides a stunning backdrop, as well as *in situ* conservation provision.

The second aspect of the Botanic Garden is the researching and display of the rich cultural and ethnobotanical heritage of Oman. A 'heritage village' containing a series of workshops and exhibition areas will illustrate the traditional crafts and skills connected with Omani plants, from weaving to dyeing, perfume making to herbalism, through live demonstrations, practical hands-on workshops, displays and interactive

sessions for the visitors. The village is surrounded by agricultural terraces, complete with an aflaj irrigation system, date palm grove, and cultivated crops exhibit to illustrate stories of farming, life and survival in the harsh climate of the country. The aim is to not just provide an immersive sensory experience for visitors, but to encourage and enable them to become part of the story, sharing their own tales and skills to help preserve Omani heritage.

Introduction to GLOs

GLOs have been developed by the Museums, Libraries and Archives Council in the UK. They apply the most up-to-date in learning theory to an exhibition and learning environment, to provide a focus and a framework for evaluation of learning outcomes, and to ensure all materials produced for public consumption are as effective as possible. They are being applied by organisations such as Bristol Zoo, Imperial War Museum, and the Natural History Museum. The latter states that ‘these outcomes apply across all our interpretation and learning media and includes our online presence and on-site physical spaces as an integrated visitor experience’ (MLA Council website June 2008)

GLOs are basically the next step on from; “what will the visitor know, understand and do as a result of their experience with us?”, which is commonly used as a starting point to develop site-based learning materials. Detailed information about where they have come from, the theoretical background and how they can be implemented and assessed, with supporting resources and documentation can be found at www.mla.gov.uk.

What are GLOs?

Generic Learning Outcomes (GLOs) are a new tool designed to help:

- Analyse education work and discover its impact on individuals and communities.
- Design better learning experiences and spaces that inspire people to learn.

They provide a framework for assessing evidence of learning and can be used to:

- Improve approaches to evaluation
- Analyse and draw conclusions about learning from existing data
- Develop staff awareness of, and practice in, learning

Generic Learning Outcomes include:

- Knowledge and understanding e.g. learning facts or information, making sense of something, making links and relationships between things, using prior knowledge differently
- Skills: intellectual, social, emotional, communication, physical, information management
- Attitudes and values: feelings and perceptions, opinions of yourself and others, attitudes (positive or negative) in relation to an experience, reasons for actions or personal viewpoints
- Enjoyment, inspiration and creativity: having fun, being surprised, inspired, creativity, exploration and making, innovative thoughts.
- Action, behaviour, progress: what people do / intend to do / have done, change in the way people manage their lives, actions, change in behaviours, progression to further changes or personal development.

We can use these definitions to help to ensure that the interpretive, or other education provision being designed, addresses the aims and objectives of a botanic garden and its education programme.

Using GLOs at the Oman Botanic Garden

At the OBG we originally developed a series of key messages that the site could communicate using its collection, and a list of themes for the interpretation provision. However, to ensure that we are able to measure and evaluate whether these objectives are being met, we needed to identify specific learning outcomes for visitors. Therefore, we went back to the initial vision and mission of the OBG project, to identify what the project wanted to achieve and how the education provision could contribute to these achievements.

OBG's vision

That the Omani botanical heritage is conserved and cherished.

OBG's mission

The Oman Botanic Garden, as a new world-class botanic garden, will work to conserve the unique botanical and ethnobotanical heritage of Oman and to ensure that the flora, heritage and ecosystems of Oman are valued by all.

From the mission and vision, a series of themes or messages were developed to act as a 'backbone' to any communication within or about the garden. They help us to ensure that any formal or informal communication contributes to and supports the organisational goals.

Central themes/messages to achieve OBG goals

- The plants of Oman are important to us and to our lives.
- The plants of Oman are special, both within Oman and in a global context.
- The plants of Oman are threatened by a range of environmental, social and economic issues.
- There are many practical things that people can do to help save protect the plants of Oman.
- OBG is working in a variety of ways to help protect the plants of Oman.
- The ethnobotanical heritage of Oman is relevant and important to us.
- The ethnobotanical heritage of Oman is threatened.
- OBG is working to conserve the ethnobotanical heritage of Oman.
- There are many things people can do to conserve the ethnobotanical heritage of Oman.

We have combined the stories within the different areas of the garden with our institutional goals, central themes and GLOs to provide a framework for designers to use for development of interpretation provision in each area of the garden. The GLOs produced for each interpretive zone provide us with targets that can be used in the formative testing of prototypes and exhibitions before our final build. We hope to apply a programme of evaluation and development for all communication provision to keep the garden relevant and effective.

Site-wide GLOs

Knowledge and understanding

We will provide opportunities for visitors to enhance their knowledge and understanding of:

- the importance of Oman's plants and ethnobotanical heritage to themselves, others and the world
- the global uniqueness of Oman's plants and ethnobotanical heritage
- the threats faced by Oman's plants and ethnobotanical heritage
- the ability of individuals to help protect Oman's plants and ethnobotanical heritage.

Attitudes and values

We will encourage our visitors to:

- value Oman's plants and ethnobotanical heritage
- feel proud of the country's botanical heritage
- want to conserve and protect Oman's botanical heritage for future generations.

Skills

We will provide opportunities for visitors to develop the following skills and abilities:

- engage in discussion about conservation and environmental issues
- become active in conservation action and live in a more sustainable way
- observe, identify, explore and research botanical and ethnobotanical material

Activity, behaviour and progression

We will encourage our visitors to:

- take an active interest in the plants and ethnobotanical heritage of Oman
- make environmentally-aware decisions and take action in their everyday lives
- act as ambassadors for both being/becoming environmentally aware after their visit.

Enjoyment, inspiration and creativity

We want our visitors to:

- view the plants and ethnobotanical heritage of Oman as a source of wonder and inspiration
- share our passion for the need to cherish and conserve this valuable resource
- become empowered and aware of the important contribution they can make as global citizens to do this.

Interpretation-zone-specific GLOs

An example of GLOs used for OBG's habitat displays is the set of GLOs for the Northern Gravel Desert display (NGD).

Habitat: Northern Gravel Desert

Theme: Deserts are transformed overnight from dormant seeds to blooming flowers

Key messages:

- There is a spring flush of annuals in the years where sufficient rain has fallen.
- Acacia woodland dominates the habitat; it houses about 10% of the country's flora.
- Overgrazing and wood-cutting threaten this habitat, but there are solutions to this problem – conservation messages

<i>Generic Learning Outcomes</i>	<i>Outcomes for this habitat</i>	<i>Interpretative media</i>	<i>Which main message?</i>
Knowledge and understanding	Seasonal rains in the desert trigger the sprouting of seeds in the soil (the rich seedbank)	Audio effect Cartoon/ model seeds	2
	10% of Oman's plant diversity is found in the Northern Gravel Desert	Cartoon/model seeds	2
	Acacia woodland dominates the habitat and is used for many different things	Panel Panel / audio	1
	The habitat is threatened by overgrazing and illegal wood-cutting, which impacts on the soil and shade for the delicate annual flowers	Artefacts / panel	3
	Many of the plants can be used for ornamental planting. As discussed, should be an outcome from many habitats, but still making sure that the main outcome from a habitat is habitat planting, not ornamentals	Panel	4,1
<i>Values attitudes and feelings</i>	The Northern Gravel Desert is a fascinating place which comes alive in the spring and should be protected and conserved	Guide / audio guide	1,2,3
	Individuals are able to help with this through specific choices		4
<i>Skills</i>	Able to chose attractive native species that would be suitable for ornamental planting	Panel	4
	Identify the key plants in the habitat - and their parts	Brass rubbings	1, 4

<i>Generic Learning Outcomes</i>	<i>Outcomes for this habitat</i>	<i>Interpretative media</i>	<i>Which main message?</i>
<i>Behaviour</i>	Use native species to landscape	Panel	4
	Act as an ambassador to restrict over grazing	Grazing interactive	4
<i>Creativity and inspiration</i>	Appreciating the beauty of native species and natural landscape	Guide	1, 2
	Look at a familiar landscape and plants with new eyes		1, 2

Education for sustainable development – brief 101

At the 1992 Earth Summit in Rio de Janeiro, Brazil, 178 countries signed up to Agenda 21, the global action plan for the 21st century, which made the role of education in promoting sustainable development explicit:

"Education ... should be recognised as a process by which human beings and societies can reach their fullest potential. Education is critical for promoting sustainable development and improving the capacity of the people to address the environment and development issues".

Agenda 21, 1992.

www.worldaware.org.uk/education/sustain.htm

Sustainable development is seeking to meet the needs of the present without compromising those of future generations. We have to learn our way out of current social and environmental problems and learn to live sustainably. It is a vision of development that encompasses populations, animal and plant species, ecosystems, natural resources and that integrates concerns such as the fight against poverty, gender equality, human rights, education for all, health, human security and intercultural dialogue.

Education for sustainable development (ESD) aims to help people to develop the attitudes, skills and knowledge to make informed decisions for the benefit of themselves and others, now and in the future, and to act upon these decisions.

- The United Nations Decade of Education for Sustainable Development (2005–2014), for which UNESCO is the lead agency, seeks to integrate the principles, values, and practices of sustainable development into all aspects of education and learning, in order to address the social, economic, cultural and environmental problems we will face in the 21st century. (<http://www.unesco.org/en/esd>)

Some say that if ESD is to be an effective tool for engaging people in negotiating a sustainable future, making decisions and acting on them, then it must first address the way we think about sustainable development and about education in general. Essential to ESD are the following skills (Adapted from Tilbury, D. and Wortman, D (2004)):

- Envisioning – being able to imagine a better future. The premise is that if we know where we want to go, we will be better able to work out how to get there.
- Critical thinking and reflection – learning to question our current belief systems and to recognize the assumptions underlying our knowledge, perspective and opinions. Critical thinking skills help people learn to examine economic, environmental, social and cultural structures in the context of sustainable development.

- Systemic thinking – acknowledging complexities and looking for links and synergies when trying to find solutions to problems.
- Building partnerships – promoting dialogue and negotiation, learning to work together.
- Participation in decision-making – empowering people.

Approaches to ESD encourage people to understand the complexities of, and synergies between, the issues threatening planetary sustainability and understand and assess their own values and those of the society in which they live in the context of sustainability. These requirements, identified by a variety of bodies connected with ESD include the need for knowledge and understanding, questioning of beliefs and values, skills and behaviours...so there is potential application of the GLOs. However, ESD is vast, so where do we start? UNESCO's key themes within ESD include:

- Sustainable Urbanization
- Sustainable Consumption
- Peace and Human Security
- Rural Development
- Cultural Diversity
- Gender Equality
- Health promotion
- Environment

Given the bias of botanic gardens and the connection with the Global Strategy for Plant Conservation it may initially be most applicable for us to focus on the environment, and specifically issues of biodiversity loss, climate change and possibly water shortage and non-renewable resource consumption.

Applying GLOs to ESD

I have found GLOs to provide a useful structure for the development of interpretation scope and planning for the education provision at OBG. There is a lot of further information on the MLA website to help with this. I would like to look today at applying GLOs to ESD – specifically whether in the time available to us we can develop a combination of GLOs to address some of the key issues within education for sustainable development, in particular regarding environmental protection. I hope that we could discuss and agree on some basic learning outcomes to use as a framework for developing a programme or interpretation design that would contribute to communicate with, for example, a local family audience. To contribute to addressing issues such as climate change, biodiversity loss, water scarcity, or non-renewable resource consumption, what GLOs can we identify that may encourage our audiences to participate in making a difference? What knowledge and understanding, skills, attitudes, inspirational and behaviour do we need to be promoting through our education and communication provision to achieve this?

Activity – applying GLOs to ESD

Each group creates the whole set of 5 GLOs for a selected environmental theme – which are then discussed to combine or consolidate producing a comprehensive list of GLOs connected with that theme that could then be used by other educators as the basis for developing programmes etc.

Your target audience is a local family group with limited prior knowledge

You have 15 minutes, at the end of this, we will discuss together for 10 minutes and produce some outcomes to submit to the rest of the conference

Evaluating whether GLOs of a programme have been achieved

I think GLOs are useful because they allow you to clarify the aims of a particular programme, which in turn aids evaluation and development of programmes. However, the diversity of outcomes may make testing challenging; how do you know if an audience has realised your creativity and inspiration objectives? Knowledge and understanding and even values, attitudes and feelings can be tested with relatively simple pre and post visit questionnaires, surveys and so on. Others may require more in-depth interviews or focus groups to identify success or gaps.

In addition to the GLOs themselves and implementation help, the MLA ‘Inspiring Learning for All’ website includes a ‘have a go at coding’ exercise to practice identifying what types of feedback may indicate success with which learning outcome. It is possible to go through the sheets to identify which questionnaire reply goes with which GLO (the answers are on the website too).

Conclusion

GLOs, although developed by the Museums Libraries and Archives Council, may provide botanic garden educators with a useful tool to focus on the important task of education for sustainable development, with their focus on behaviours, attitudes and skills. We can use GLOs to plan and evaluate designs in a range of communication methods. By discussing some of the main themes within environmental issues of sustainable development, we can develop GLOs that may be applicable to many botanic gardens worldwide as a basis for ESD programmes.

Appendix I

Outcomes of workshop session at the Congress

Below are the outcomes of the activity run during the Congress, where three groups of workshop participants tried using GLOs as a framework for developing learning outcomes to explore the theme of ‘biodiversity’. Feedback from participants suggested that as this is such a large field it is very difficult to pin point three or four key knowledge outcomes or behaviour outcomes that would be required for our target audience to be able to understand to make a difference to the crises facing biodiversity today. However, equally it is important for our work to be focussed and clear in its aims, so we may be able to pick a few out of the items identified to use in one particular programme or aspect of a programme.

Another feedback comment was about the division between, for example, knowledge and skill or skill and behaviour – where does one become the other? There may be some level of redundancy, but the working of outcomes is also important. For example, you may want participants in a programme to learn the main features of an oak tree; the associated skill as a result of this may be the ability to identify an oak tree amongst many other tree species.

Generic Learning Outcomes: exploring the theme of biodiversity loss

The GLOs are what we would want our target audience to know, be able to do, feel, be interested in and actually do as a result of a programme on biodiversity loss.

Knowledge and understanding:

- How many plant species there are worldwide?
- How many plant species there are locally (in your city)?
- What terms such as native, endemic, indigenous mean.

- Reduction in numbers of individuals in a species can lead to weakness in species, which can lead to extinction.
- Due to interconnectedness of living things, it is not enough to save one species.
- Meaning of 'biodiversity' – terminology, through examples in garden – find out first how much they know and their understanding they have, what is their background, how do you make it relevant to their lives.
- Relationship of humans to living things.
- Rate of loss of biodiversity – facts and figures.
- Implications / impacts of the loss.
- Reasons for biodiversity loss.
- Solutions – ideas for overcoming biodiversity loss
- Ecosystems services and human need for nature and how this is connected with biodiversity loss.
- 'Better to have a tree than a log'.

Skills

- Ability to communicate messages and inspire others – to become ambassadors for plants and understand that everyone can make a difference.
- Propagation skills / cultivation skills.
- Able to recognise / know what to look for in 'green' products.
- Ability to identify species and habitats – particularly icons, familiar friends; use of 'flagship' species.
- Ability to identify problems / issues within an area, leading to empowerment and resulting from a personal connection with nature.
- Observation skills to help overcome plant blindness.

Attitude and value

- Caring about biodiversity and its loss.
- Desire to do something about it and initiate action.
- Change in attitude and value.
- Feeling that they can make a difference, empowerment.
- Sense of ownership.
- Belief in the intrinsic value of nature – for its own sake.
- Desire to inspire others.
- Motivation to make a difference and change their own behaviour.

Enjoyment, inspiration, creativity

- People will enjoy nature and have fun.
- Enjoy their local biodiversity.
- Increase curiosity about nature.
- They will find ways to overcome biodiversity loss creatively, creative approaches to addressing problems.
- Respond creatively to nature e.g. art, poetry, music, writing.
- Be excited and inspired by nature.
- Relax and feel calm in nature.

Behaviour

- Vegetarianism, ‘meat-free Mondays’.
- Making lower impact consumer choices.
- Explore local environment.
- Donate to biodiversity conservation programmes.
- Act as ambassadors for biodiversity.

Any other ideas on what sort of GLOs we can use to explore biodiversity loss, or any of the key ESD topics are most welcome – please contact the author of this paper.

Further reading

Museums, Libraries and Archives Council. <http://www.mla.gov.uk>.

GLOs are part of the MLA’s inspiring learning for all programme ‘ an improvement framework for museums, libraries and archives’. <http://www.inspiringlearningforall.gov.uk>.

Case studies on MLA - museums, libraries and archives that have applied GLOs at <http://www.inspiringlearningforall.gov.uk/successstories>.

Resources, such as stimulus interview questions for eliciting results in interpretation surveys testing for GLO success or otherwise, are documented in the web page http://www.inspiringlearningforall.gov.uk/export/sites/inspiringlearning/resources/repository/Question_Bank_New.doc.

Recent conversation on *Curator* – the museum journal about GLOs and similar at <http://curatorjournal.org/archives/160/comment-page-1#comment-18>.

Critique of GLOs from Professor Stephen Brown of De Montfort University, Leicester, UK, at http://www.pedagogy.it/images/pdf/generic_learning-outcomes.pdf.

References

UNESCO. *Education for sustainable development*. <http://cms01.unesco.org/en/esd>.

Museums Libraries and Archives 'Inspiring Learning for All' programme, including development of Generic Learning Outcomes. www.mla.gov.uk

Tilbury, D. and Wortman, D (2004). *Engaging People in Sustainability* [http://en.wikipedia.org/wiki/Education for Sustainable Development](http://en.wikipedia.org/wiki/Education_for_Sustainable_Development)

Using poetry to develop ecological literacy

Diana Woodcock

Virginia Commonwealth University in Qatar, Qatar

Environmental issues and the role of poetry in educating people to those issues have interested me for a long time. Many of my published poems express environmental concerns. My favorite poets are those who write about our relationship to the natural world: Wendell Berry, Gary Snyder, Mary Oliver, Thich Nhat Hanh, Hildegard de Bingen, Pablo Neruda and Walt Whitman, to name a few.

During today's workshop, I will invite you to share favourite poems (your own included) about the environment, botanical gardens and the cultivation of plants. But let's talk first about poetry's vital role in plant conservation, in environmental justice, and in highlighting the botanic garden's value in teaching the general public about plants, sustainability and our innate need to protect, cultivate, and be nurtured by them. Since poetry always has been a form of relationship with the Earth and a way of expressing this relationship, let's explore ways to stimulate development of environmental sensitivity and expression of people's creative potential through poetic endeavours. Poetry is one way of learning about environmental justice, conservation issues, and the role of botanical gardens in our endangered world. As an alternative to science, it can be an exciting way of sharing the history and evolution of botanical gardens, of describing individual plants, and of exploring the benefits of gardening.

I'd like you to consider three questions: (1) What are some convincing and logical arguments for connecting poetry with conservation and environmental justice? (2) How can spiritual and scientific approaches to ecological challenges be interwoven and brought to light through poetry? and finally (3) How can poetry help to instil in people a sense of responsibility for a sustainable future? Our time together in this workshop will be too short to cover all three; we will only discuss the first one. The other two are for you to take with you and ponder in the weeks and months following this congress.

So let's talk about those convincing and logical arguments for using poetry to develop ecological literacy. Regarding ecopoetics, Crystal Koch makes a strong case for connecting poetry to conservation and environmental justice:

Poetry and life both originate from inside the body, and with the post-modern realization that the outer workings of the natural world affect the inner workings of the body, a link is created between poetry and the state of the environment. In this sense, poetry has become perhaps the most direct means of addressing an environment in crisis . . . The biological nature of poetry makes it not only a tool for change, but a mirror in which we can see reflected the ways we as humans interact, perceive and respond to our environment.

<http://www.moriapoetry.com/koch.html>

Sara Dunn, in *Poetry for the Earth*, describes poetry as an inclusive medium:

This inclusivity – Emerson's 'integration of the parts'—together with distilled subjectivity, avoidance of the doctrinaire, and resistance of dichotomies (avoiding the simplistic distinction between what is natural and what is unnatural, what is rural and what is urban) make poetry an invaluable tool with which to explore the nature of human interaction with the external world. (Introduction, p. xviii)

Who can remember a poem or a song that sparked your interest in plants, gardens, nature? One that greatly influenced me when I was a university student is John Denver's *To the Wild Country*. First released on his *I Want To Live* album, this song also appears on four other albums: *Earth Songs*, *Country Classics*, *The Very Best of John Denver*, and *The John Denver Collection - Rocky Mountain High*:

*There are times I fear I lose myself
I don't know who I am
I get caught up in the struggle and the strain
With my back against a stonewall
My finger in the dam
Losing strength and going down again*

*And I take a look around me
My eyes cant find the sun
There's nothing wild as far as I can see
Then my heart turns to Alaska
And freedom on the run
I can hear her spirit calling me*

*To the mountains, I can rest there
To the rivers, I will be strong
To the forest, Ill find peace there
To the wild country, where I belong*

*Oh, I know some times I worry
On worldly ways and means
And I can see the future killing me
On a misbegotten highway
Of prophecies and dreams
A road to nowhere and eternity*

*And I know its just changes
Yes, and mankind marching on
I know we cant live in yesterday
But compared to what were losing
And what it means to me
Id give my life and throw the rest away*

*To the mountains, I can rest there
To the rivers, I will be strong
To the forest, Ill find peace there
To the wild country, where I belong
To the wild country, where I belong*

Let me ask you now to think of a time when you said or did something that influenced a child to respect and protect nature. Who would like to share with the group?

Now think of a time when someone influenced you to respect and protect nature. Would someone share with us about such a time?

Now let's look at a slide of a child captivated by one tiny aspect of nature:



How does poetry for children prepare the young to join the environmental movement?

Now I'd like to share several poems before asking you to share your favourites. The first one is by Sam Hamill and is entitled *The Orchid Flower*:

*Just as I wonder
whether it's going to die,
the orchid blossoms*

*and I can't explain why it
moves my heart, why such pleasure*

*comes from one small bud
on a long spindly stem, one
blood red gold flower*

*opening at mid-summer,
tiny, perfect in its hour.*

*Even to a white-
haired craggy poet, it's
purely erotic,*

*pistil and stamen, pollen,
dew of the world, a spoonful*

*of earth, and water.
Erotic because there's death
at the heart of birth,*

drama in those old sunrise

prisms in wet cedar boughs,

*deepest mystery
in washing evening dishes
or teasing my wife,*

*who grows, yes, more beautiful
because one of us will die.*

This next poem, by Hart Crane, is entitled *The Air Plant, Grand Cayman*:

*This tuft that thrives on saline nothingness,
Inverted octopus with heavenward arms
Thrust parching from a palm-bole hard by the cove
A bird almost of almost bird alarms,*

*Is pulmonary to the wind that jars
Its tentacles, horrific in their lurch.
The lizard's throat, held bloated for a fly,
Balloons but warily from this throbbing perch.*

*The needles and hack-saws of cactus bleed
A milk of earth when stricken off the stalk;
But this, defenceless, thornless, sheds no blood,
Almost no shadow but the air's thin talk.*

*Angelic Dynamo! Ventriloquist of the Blue!
While beachward creeps the shark-swept Spanish Main
By what conjunctions do the winds appoint
Its apotheosis, at last the hurricane!*

The next poem, entitled *Citrulus Colocynthis*² is a prose poem I wrote after going out into the Arabian Desert to find wildflowers:

All day clouds hung over the desert. Wind blew as if to brew a great storm of hard long rain. But once again, nothing came of them. Beside a wadi, I waited—endured hunger and heat, slept among bitter apples: colocynth thriving on sandy loam, its perennial root sending forth scabrid vine-like stems. Solitary yellow flowers bloomed in the leaves' axils. Lemon-sized gourd-like fruit was filling up with soft white poisonous pulp in which flat ovate seeds would eventually please birds of passage who'd come to disperse them. Unable to resist, I tore one from the ground to transplant in my garden. But its delicate microscopical leaf structure caused it to wither within an hour. Clouds still hanging low, wind continuing to blow, I recalled how its fruit flourished profusely between Palestine's mountains and the Mediterranean's eastern shore, Gaza to Mt. Carmel—soil and climate all-sufficient for its growth. I took note: Leave things where they grow. Wild gourd of the Old Testament²—earth gall, exceeding bitterness—and yet, its nutty-flavoured seeds taken from their poisonous enclosure, innocuous. In hard soil, widespread. Desert bedouins grind and make a bread. Precious food source of one Central Saharan tribe—Tibboo Resade—seeds tramped on to remove the last traces of bitter pulp, cleaned by winnowing, mixed with ashes from camels' dung, placed on a smooth stone and rubbed with another to crush the testa, kernels sifted,

² Authorised (King James) version of the Bible. II Kings 4:39.

boiled in water, dried in the sun, then mixed with desiccated powdered dates. Finally palatable, nutritive. This is how we live: tearing through the toxic enclosure to what can sustain us.

Now it's your turn. Please share your favorite botanical poems.

Let's turn our attention now to specific pointers on how poetry can assist in biodiversity/botanic education. I'll share some ideas for getting yourself and others writing about biodiversity, plant conservation and environmental justice. Then I'll ask you to add to the list any activities, writing prompts, and field trips that have worked for you:

- Brainstorm/list words you identify with botanic gardens and the environmental crisis. Choose one to free-write on for 10 minutes. This is grist for a poem.
- Two-hour field trip: Record images and impressions. Recreate it for someone else.
- Write a poem that is a conversation between you and a politician about one plant under siege.
- Write a poem or letter to one extinct plant, making a confession or apology.
- Write a poem in a plant's voice. Read Louise Gluck's book *The Wild Iris* for inspiration.
- Make a list of your most memorable experiences in gardens and among plants and trees. Start a poem about one of them.
- Listen to John Williams' concerto entitled *TreeSong*, inspired by his favorite tree in Boston's Public Garden, the dawn redwood (*Metasequoia glyptostroboides*) from China.³ Now, think of your favorite tree, plant, flower or shrub; write a poem inspired by it.
- Find a plant you've never heard of and assume few people know about. Get to know it intimately, and then write a poem to introduce it to the world.

Let's turn our attention to resources for botanic education. First, let me suggest the following websites to inspire young people to write about the environment:

- Center for Biological Diversity: <http://www.biologicaldiversity.org/>
- River of Words: <http://www.riverofwords.org/home/introduction.html>
- Children of the Earth: <http://childrenoftheearth.org/seigelman.htm>
- eLanguages (Creative Collaboration for Teachers Globally):
http://www.elanguages.org/view_pagecontent.php?resourceid=9947;id=r9947#r9947
- National Environmental Education Week: http://www.eeweek.org/resources/green_reading.htm
- Children's Environmental Literature:
<http://www.dnr.state.wi.us/org/caer/ce/eeek/teacher/pdf/Literaturelist.pdf>
- Robert Redford & Youth Speaks Fighting Global Warming with Slam Poetry:
<http://www.npr.org/templates/story/story.php?storyId=92584973>
- The Academy of American Poets: <http://www.studyplans.com/Poetry.htm>
- Free environmental software "Neat Stuff for Kids": <http://www.ehsfreeware.com/kidsns.htm>

³ This concerto can be heard on the American Public Radio website at http://composersdatebook.publicradio.org/listings/datebook_20080707.shtml

- Kids Links Teaching Green: <http://www.ecomall.com/biz/kidslinks.htm>

Now for book suggestions:

- *Sleeping on the Wing* (anthology) – Kenneth Koch and Kate Farrell
- *Poetry for the Earth* – Sara Dunn, editor
- *Fireflies* – Rabindranath Tagore
- *The Tracks We Leave: Poems on Endangered Wildlife of North America* – Barbara Helfgott Hyett
- *The Poet's Companion* – Kim Addonizio and Dorianne Laux
- *The Practice of Poetry* – Robin Behn and Chase Twichell, editors
- *Writing Down the Bones* – Natalie Goldberg
- *If You Want to Write* – Brenda Ueland (Carl Sandburg called it “the best book ever written about how to write.”)
- *Poetry: A Sketchbook Approach to Writing and Reading Poetry* – Priscilla Adams
- *Flora Poetica* – Sarah Maguire.

Let me leave you with some favorite quotations:

Do not divert your love from visible things. But go on loving what is good, simple and ordinary—animals and flowers, and keep the balance true.

Rainer Maria Rilke

“When all is perishing moment by moment, Who has time to be bored?”

Yunus Emre

“The universe came into being with us together with us, all things are one.

Chuang-Tzu

We all travel the Milky Way together, ...trees and men...trees are travelers, in the ordinary sense. They make journeys, not very extensive ones, it is true; but our own little comings and goings are only little more than tree-wavings—many of them not so much.

John Muir

And a few lines from poet Gerard Manley Hopkins:

*What would the world be, once bereft
Of wet and wildness? Let them be left,
O let them be left, wildness and wet;
Long live the weeds and the wilderness yet.*

Gerard Manley Hopkins, from *Inversnaid*

I will give you a handout of some botanical poems to inspire you as you go from this Congress. Armed with the poems and with the two questions we don't have time to answer in this workshop, I hope you will continue to think about poetry's vital role in developing ecological literacy.

Posters

Enhancing education for sustainable development at the Nairobi Botanic Garden

Brenda M Onyancha

Nairobi Botanic Garden, Nairobi, Kenya

ENHANCING EDUCATION FOR SUSTAINABLE DEVELOPMENT AT THE NAIROBI BOTANIC GARDEN

By: Brenda M. Onyancha. Email: bmonchari@museums.or.ke

Introduction:

The Nairobi Botanic Garden is situated 1.5 kilometers from the city centre. The garden was established with an aim of enhancing learning of plant science for sustainable development using thematic displays. Currently, the garden is home to some 600 indigenous and 100 exotic plant species and cultivars growing in 10 developed thematic displays. The themes integrate Kenya's natural, historical and socio-cultural aspects with habitat displays. Some of the programmes covered include adapt or die (school children), medicinal and food plants of Kenya (communities) and economic uses of plants

Succulent garden:



This is a display of succulent plants like Euphorbia, Aloes, Monadenium, Pyrenacantha. It is used to highlight how

plants are adapted to dry habitats.



Aloe laterita



Euphorbia sp.

This thematic display helps in creating awareness in terms of compliance with regulations governing aloe products and their utilization. It also helps highlight the role of succulents in environmental conservation.

Acknowledgements: National Museums of Kenya, Nairobi Botanic Garden Staff and Audio-visual department.

Orchids:

Like many other plants and animals, orchids face an uncertain future in their natural habitats. This themed display helps to highlight conservation effort to ensure orchid survival. Orchids are epiphytes and they are economically important.



Ansellia africana

A flagship orchid species in Kenya



Vanilla polylepis

A Vanilla plant in the display house

Herbal garden:

This is a themed garden that is helping cover new ground in plant conservation through community involvement with herbal medicine, interpretation and cultivation. It showcases some of Kenya's indigenous food and medicinal plants.



Urtica masaica

An indigenous medicinal/vegetable plant



A learning session in the herbal garden

Pond:

Besides plant adaptations, this display helps highlight important plants used for water (a very scarce resource) treatment. Some of the plants in the display include: water lilies, papyrus and salvinia



Useful woody plants:

The display showcases indigenous plants and puts emphasis on the economics of botany in relation to uses and diversity. Some of the plants include



Macadamia tetraphylla, Olea africana, Erythrina abyssinica, Prunus africana.

Other Activities:



Children planting a tree

The garden supports other activities that are geared towards environmental conservation like: Bird watching, tree planting, recreation and out door activities on beautiful lawns in the garden

For more information contact: The Manager, Botanic garden, P. O. Box 40658-00100, Nairobi, Kenya. Email: Botany@museums.or.ke Fax: 254-20-3742414 Tel: 254-20-3742131-4, ext: 2286 or 2274 (EA herbarium) Website: <http://www.museums.or.ke>



The Ethnobotanical Garden of the Park of Hann, Dakar, Senegal

Didier Roguet

Conservatoire et Jardin Botaniques de la Ville de Genève, Geneva, Switzerland

THE ETHNOBOTANICAL GARDEN OF THE PARK OF HANN, DAKAR • SENEGAL

AN INTEGRATED EDUCATIONAL PROJECT AND A SOUTH-NORTH JOINT VENTURE

Environmental Education Centre was built and the Botanical Garden of the Park was rehabilitated for Education and Biodiversity Conservation. The project is supported by the Conservatory and Botanical Garden of Geneva.

LOCATION
Forestry and Zoological Parks of Hann in Dakar, Capital city of Senegal

MAIN ACTIVITIES

- to organize EE training for teachers and students (around 1500 in 20 schools per year)
- to supervise rehabilitation process of the ethnobotanical garden for Education and Biodiversity Conservation
- to make Interpretation of Plants and Animals of the Park for teachers, students and others visitors
- to help the Park to reinforce its vocative education by promoting EE for population in general and youth in particular and giving them opportunities to better understand and protect their environment
- to promote pupils messengers for environment protection towards their families, districts, cities and country.

The botanical garden was created in 1934 for species acclimatization and reintroduction through West Africa. It was abandoned for many years.

Since 2002, with the project CEEH, we began a rehabilitation process. This garden is 2 ha wide with 13 plots thematically and ethnobotanically classified. Talking about many uses of plants by Human being in Senegal: medicinal plants, picking plants, plants for foods, dyes or fibers, plantes to feed the animals, plants to build plants used for charcoal production And so on.

This Ethnobotanical garden contains nowadays around 200 identified and labelled species. It is more and more visited by school for natural science courses.

As many african countries, the third of senegalese population lives in the capital city (Dakar) with only one green space, the Forestry and Zoological Parks of Hann (60 ha wide) commonly called Park of Hann.

With its environmental education centre and ethnobotanical garden, the Park of Hann which receives around one million visitors per year, allows population to know more the importance of ethnobotanical gardens in education, cultural heritage and biodiversity conservation.

**PARC DE HANN
B.P. 1631 DAKAR / SENEGAL
EMAIL: ALTINE_TRAORE@YAHOO.FR**



MAP OF THE BOTANICAL GARDEN

LÉGENDES

1. Plantes décoratives de l'habitat
2. Plantes légumières / alimentaires
3. Plantes fruitières
4. Plantes menacées
5. Plantes fruitières forestières
6. Plantes médicinales
- 7-8. Plantes parfumées / à parfum
9. Plantes industrielles
10. Plantes productrices de bois d'œuvre, de service et de chauffage
11. Plantes fourragères
12. Plantes condimentaires / épices
13. Plantes aquatiques

• Entrée du jardin ethnobotanique
— Allées
● Bassin
□ Limite du jardin ethnobotanique
■ Secteurs du jardin ethnobotanique

APPLIED ETHNOBOTANY IS A KEY TO MAKE OUR VISITORS AWARE, IN THE NORTH AND IN THE SOUTH, ABOUT THEIR CLOSE RELATIONSHIPS WITH THE PLANTS WORLD AND THEIR RESPONSIBILITY ON IT FOR THE FUTURE GENERATIONS.



CONSERVATOIRE & JARDIN BOTANIQUE VILLE DE GENÈVE






Le Conservatoire botanique national de Brest

Loïc Ruellan

Conservatoire botanique national de Brest, Brest, France

Le Conservatoire botanique national de Brest

Out of the 420 000 plant species inventoried on our planet, 20% are threatened with extinction. In an attempt to stem the decline of wild flora, the Conservatoire botanique was founded in Brest in 1975.

Preserving the plant diversity

The Conservatoire botanique national de Brest was the first establishment worldwide to exclusively dedicate its work to rescue of endangered plants. Within its seed bank and cultivation areas, it holds one of the main collections of plant species, essentially of Armorican massif, France, Europe and islands around the world.



Protecting plants in their natural habitat

Along with its international programmes, the Conservatoire botanique national de Brest fulfils the mission set by the French state of insuring the protection of the rarest plants of West of France. Above all, the botanists are working to maintain these species in their natural habitats. If the survival of these plants in the natural environment is threatened, they are cultivated and their seeds kept in cold seed bank.



Raising public awareness

Visiting the exhibitions of the information centre, discovering the trail about conservation in the greenhouses and the unique collections of endangered species, strolling along the pathways of the Conservatoire botanique are all ways for the public get close to the phenomenal diversity of the plant world and feel for themselves how important it is to protect this heritage for future generations.



Les Conservatoires botaniques nationaux (CBNs network)

Based on our approach, the French ministry of the environment decided to develop a network of national botanical conservatories in 1988. Each CBN accredited by the government contributes to the knowledge and protection of wild flora, management and preservation of natural habitats on its accredited territory and information to public about stakes related to conservation of plant diversity. To date, there are eleven Conservatoires botaniques nationaux approved by the Ministry of the environment in France.



Loïc Ruellan, educator.
Conservatoire botanique national de Brest
52, Allée du bot
29200 Brest - France
www.cbnbrest.fr



Environmental education through multipliers: children's education at Singapore Botanic Gardens

Janice Yau, Winnie Wong & Neok Chein Low

Singapore Botanic Gardens, National Parks Board, Singapore

In this millennium of global warming and climate change, environmental education (informing and creating awareness that everything and everyone on Earth are interconnected) is key. Many of us are facing a race against time; to educate, change mindsets and to convince people to take action, change lifestyles and live sustainably. The question here is: what strategy should one take to push boundaries, to reach out to even more people in order to be most effective in making a significant difference?

At Singapore Botanic Gardens (SBG) we use the word 'multiplier' to mean people whom we can train or equip with the necessary knowledge (and skills), to help us spread the message of environmental education, i.e. embark on our quest with us, with the purpose of increasing greatly (like in the multiplication tables) the numbers of participants/target groups reached. (Multipliers create a 'multiplier effect'). For example, we run nature education training/familiarisation workshops for educators, so that these educators (multipliers) can, in turn, spread the knowledge and passion for nature to the students/wards under their charge. Hence, producing a multiplier effect.

On 1 Oct 2007, Singapore Botanic Gardens (SBG) opened the Jacob Ballas Children's Garden (JBCG), as a specialized garden dedicated to children. At JBCG, we create happy memories for children in a fun and wonderful garden in order to cultivate awareness and develop appreciation of plants, nature and the environment, in line with the UN Global Strategy for Plant Conservation (GSPC) Target 14. One of the strategies we adopt at JBCG is to work with multipliers to provide environmental education programmes and activities through fun and creative play. Training programmes were developed and implemented to equip and facilitate learning for educators and student leaders. Collaborations and partnerships were set up with NGOs, institutions of learning and environmentally-conscious corporations. At the same time, SBG (which includes JBCG) is marketed as a venue for spreading the environmental message. Our multipliers, who are now our partners in the cause, have become our extensions and support system to spread environmental messages.

The ultimate goal is to translate this knowledge into values, build life-long skills that promote a sense of personal responsibility for the environment, and empower action for change. We work towards encouraging positive attitudes and behaviour toward preserving and ensuring the sustainability of Earth's life-support systems for ourselves and future generations. SBG's experience in engaging multipliers for environmental education that is fun and incorporates natural play, as can be seen in this Congress poster.

ENVIRONMENTAL EDUCATION THROUGH MULTIPLIERS CHILDREN'S EDUCATION AT SINGAPORE BOTANIC GARDENS

Environmental education is all about informing and creating awareness that everything and everyone on earth are interconnected. In this millennium of global warming and climate change, many of us are facing a race against time; to educate, change mindsets and convince people to take action, change lifestyles and live sustainably. On 1 Oct 2007, Singapore Botanic Gardens (SBG) opened the Jacob Ballas Children's Garden (JBCG), a specialized garden dedicated to children. At JBCG, we create happy memories for children in a fun and wonderful garden for the purpose of cultivating awareness and developing appreciation for plants, nature and the environment, in line with the UN Global Strategy for Plant Conservation (GSPC) Target 14. What strategies should one take to push boundaries, to reach out to even more in order to be most effective in making a significant difference for our environment? At SBG, we work with multipliers to provide environmental education programmes and activities through fun and creative play.

SCHOOLS

Environmental programmes were developed and implemented to equip and facilitate learning for educators and student leaders.

Students Leaders as JBCG Student-Guides



MGS student-guides sharing the green message with visitors to JBCG.

NUS High student guide pointing out sweet potato in an informative guide tour.

SBG's Education team puts each student leader through at least 6 hours of familiarisation, rigorous training and assessment in preparation to be a Student-Guide of JBCG. The pilot JBCG Student-Guide Programme was undertaken by 33 Methodist Girls School students. Our first pool of 33 Student-Guides spread conservation messages and promoted greenery appreciation through guided tours for visitors. This programme provides an opportunity for students to give back to the community as part of their school's Community Involvement Project (CIP). For the NUS High School of Mathematics and Science, the JBCG student-guide program is part of the school's Research and Innovation program called Science Communication, whereby it provides 12 students from the school with the opportunity to engage an audience from the public on Science. This program aims to sharpen students' creativity, critical and analytical thinking and especially, presentation skills. To date, the Student-Guide Programmes have reached out to more than 350 visitors to JBCG.

Educators as Multipliers



Educators getting up close to aromatic plants at the JBCG Floating Platform.

Educators sharing information on highlights at JBCG.

Early Childhood Educators capturing memories and observations for posterity.

JBCG was graced by the visit of 33 early childhood educators from Japan, Hong Kong, Malaysia and Singapore on 15 August 2009. This study tour was part of the itinerary of the 2-day CMEP (Organisation Mondiale Pour L'Education Prescolaire or World Organisation for Early Childhood Educators) Asia-Pacific Regional Meeting and Conference, themed 'From Caring Responsible Children to a Sustainable Future'. The group was introduced to JBCG through a talk and guided walk highlighting special nature education features in the Children's Garden. Sharing of information continued on 1 September 2009, with JBCG hosting 68 students pursuing the Wheelock College (Boston) B.Sc in Early Childhood Educational Studies and Leadership, a degree programme requiring the Ngap Ann Polytechnic Diploma in Early Childhood Education as a pre-requisite. The Teacher's Training Workshops at JBCG has reached out to more than 400 educators to date.

Non-Governmental Organizations (NGOs)



Facilitators from CTEP sharing amazing facts on frog and toads.

CTEP's Eco-Living Exhibition which makes its rounds to schools and organisations.

For awareness on wildlife and its conservation, we are into our 2nd year of collaboration with a NGO, Cicada Tree Eco-Place (CTEP), to run the 'MAD (Make A Difference) Lessons For Wildlife'. These environmental lessons have reached out close to 700 participants through more than 45 programme runs to date. Roving exhibition posters produced by CTEP on Eco-Living, supported by SBG, encourages its audience to embrace our natural heritage and good eco-habits has made its rounds 18 schools and organisations all over Singapore to date.

Corporate Social Responsibility (CSR) Programmes



Intel volunteers planting out seedlings at the Potting Garden of JBCG.

After a hard day's work.

In mid 2008, forty volunteers from Intel Technology Asia Pte. Ltd. kick-started the Corporate Social Responsibility Programme at JBCG, chalking up a total of 190 volunteer-hours through re-landscaping JBCG's sensory garden with aromatic plants, the fruit and vegetable garden, and interpretative sign-making. Their efforts have been enjoyed by more than 100,000 visitors to JBCG to date. On 28 Oct 2008, 38 Standard Chartered Bank staff from London volunteered a total of 4 hours a person at JBCG.

ENVIRONMENTAL EDUCATION THROUGH MULTIPLIERS CHILDREN'S EDUCATION AT SINGAPORE BOTANIC GARDENS

Partners promoting Drama & Art Expressions



Bear & Chicken entertaining the audience at the Party Place of JBCG.

'Nature & Me' workshop led by a drama specialist.

Children capturing memories with Busy Bee, Butterfly and Spider.

JBCG's art and drama partners provide the expertise required to sow the seeds for love and respect for nature. Facilitators and performers tell stories and use props to encourage young participants to express their creativity and let loose their inner child. After each session, participants bring home with them some very important messages on caring for the Gardens and the environment. Performers from the Arts Theatre of Singapore Ltd presented funny yet educational performances in Mandarin, to teach children conversational Mandarin in a fun way, using nature- and environment-related words, phrases, songs and nursery rhymes.

Events with Environmental Education themes



A Clarins facilitator educating students using the Carbon Footprint Game.

Interacting with young visitors, disseminating information on DO's and Don'ts for the environment.

In making Singapore Garden Festival 2008's Clarins Learning Garden a success, more than 25 Clarins beauty consultants were trained and familiarised to facilitate this board game designed by CTEP and SBG, suitable for children 6 years and above. More than 3,000 pre-school and primary school students had great fun playing the Carbon Footprint Game and learning about how to reduce carbon footprints through positive eco-actions, thus living a more eco-friendly life and ensuring that our planet remains healthy for generations to come.

COLLABORATORS & PARTNERS

Collaborations and partnerships were drawn with NGOs, institutions of learning and environmentally-conscious corporations. At the same time, SBG is marketed as a venue for spreading the environmental message.

Janice YAU, Winnie WONG, Neok Chein LOW
Education Branch,
Singapore Botanic Gardens,
National Parks Board,
1 Cluny Road, Singapore 259569
Email: nparks_sbg_edu@nparks.gov.sg

IN CONCLUSION

Our multipliers, who are now our partners in the cause, become our extensions and support system to spread environmental messages. The ultimate goal is to translate this knowledge into values, build lifelong skills that promote a sense of personal responsibility for the environment, and empower action for change. We work towards encouraging positive attitudes and behaviours toward preserving and ensuring sustainability for Earth's life-support system for ourselves and our future generations.

