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JOURNAL of BIOPHILIC DESIGN

EDUCATION

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ISSUE 9, February / March 2024 – NEURODIVERSITY
ISSUE 10, April / May 2024 – ENVIRONMENT
ISSUE 11, June / July 2024 – LEISURE/HOTELS
ISSUE 12, August / September 2024 – RETAIL
ISSUE 13, October / November 2024 – CHILDHOOD
ISSUE 14, December 2024 / January 2025 – THIRD AGE
ISSUE 15, February / March 2025 – LIGHT
ISSUE 16, April / May 2025 – SOUND

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WELCOME

Welcome to the seventh edition of The Journal of Biophilic Design.

When you think about your own school or university experience you might have traumatic memories or absolutely amazing ones (we can debate how our brains focus on one or the other another time!), but for a moment think back about how much "nature-connection" you had.

For me, growing up in the 70s, I was in London, the primary school playground was concrete, asphalt and brick, and there was a little bank of trees shielding us from the petrol station on the other side of the wall where the boys would invariably kick their footballs over to. In my secondary school there was the "teachers' garden" where you weren't allowed to play unless it was a special day and you were 17 plus and in the 6th form.

That exclusivity of nature from the rest of the school was a bit bizarre thinking about it. But the expectation of a paved and grey playground was the norm. I was lucky because my mother was a bit of an eco-nut and my father an outdoorsy kind of guy, so my free time outside of school was spent in the woods with the dog, walking, on the beach. I remember fondly those long day trips in the back of the car, with books, sandwiches and then exploding out of the confines of the vehicle and onto the field where we parked our car, had a picnic and then spilled out onto the beach. Hours and hours we spent outside.

Now I'm involved in exploring why biophilic design is good for us, how we bring it in and the thousands of benefits it bestows on us, I'm sitting here typing this on a Sunday morning wondering why the heck do we still design schools in a way where children are withdrawn from nature and then our secondary and new tertiary educational establishments continue in the same vein.

However ... and here's the good news ... there is a change. And the Department of Education here in the UK is now incorporating Biophilic Design into the fabric of schools. We are still a long way off from it permeating every place of education, but it's an amazing start! Watch out for a podcast coming up!

In this issue, I am so thrilled to share with you some brilliant case studies which show how it can be done ... brilliantly ... Take a look at the De Verwondering, a Biophilic Primary School, where 85% of the above ground construction is built of natural materials, the ventilation system of hatches allow the smell of new mown grass to float in. Putney High School is another of an amazing green infrastructure campus, where there is access to play in nature, but inside the building itself there is also a dramatic reduction of CO2 with a 58% improvement in the air quality. Oliver Heath's sensory school as well as Determan's Bethel-Hanberry elementary school design celebrates biomorphic forms. All these Biophilic Design interventions also help reduce absenteeism. Make sure you take a look at and share the Good Plant Guide generously given by Clare Bowman of RCZM Architects.

Vanessa Champion PhD, AMRSPH
Editor and Founder

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www.journalofbiophilicdesign.com

HIGHLIGHTS

Each edition of The Journal of Biophilic Design has regular sections. We highlight them here so you can navigate your way around the Journal. If you would like to contribute to a future edition, please do contact our editor we would love to feature your research and case studies.

Details of our contributors can be found on our website.
Each edition of The Journal of Biophilic Design is published every other month.
Next issue's focus is **Wellbeing.**

Sign up for our newsletter on our website to be reminded when the edition is out. Don't forget you can read this on your Kindle as well as buy a beautiful full colour printed edition to keep and refer back to, contact us for direct links.

If you would like to sponsor the Journal please contact us.
Future editions will focus on Wellbeing, Neurodiversity, Environment, Leisure, Retail, Childhood, Third Age, Light, Sound.

EDUCATION

The Hackney Garden School

"A little while back Oliver Heath Design were asked to reimagine the design of an unused space at the Hackney Garden School in London for children with special needs of between 4 to 16 years of age. To complete the design, the project team partnered with Interface the sustainable flooring supplier and our design partners who generously funded the refurbishment project."

Oliver Heath

The space, once intended to be a staff gym, had since become a dumping ground, located adjacent to a concrete playground. Staff shared with us that many of the children found the playground overwhelming with noise and activity, unsuited for the purposes of recuperation between classes and instead becoming a cause of stress and anxiety.

While much of the school décor was oriented towards cost effective ease of maintenance, the grey linoleum floors and white walls did little to engage the children's senses or suggest an intended function be that work, rest, or play.

We decided to take an alternative approach, enhancing nature connections through Biophilic Design patterns to relax, restore, and engage. However, we were told that plants were off the cards, or we would risk them being quickly destroyed by the children.

Often limitations such as this offer great opportunities to innovate and explore, so we chose instead to utilise indirect connections to mimic and evoke a feeling of nature, creating spaces that would nurture and restore.

The room, a relatively small wedge-shaped space of approximately 5 metres long, was just two meters wide at the entrance way and 3 metres at the far end. However, by zoning to deliver different functions we created 3 distinct areas to facilitate space which allowed children to recuperate effectively. Before returning to classes.

The first was a simple window seat which offered the children a sense of prospect to observe activity in the playground, albeit behind the safety of the double-glazed windows. Built of timber and softly carpeted it was a space to stop, sit and gaze into the distance while maintaining the optimum level of natural light to support healthy circadian rhythms.

Photo credit: Oliver Heath

Photo credit: Interface

Opposite the window seat we focussed much of our design attention, and budget, on a series of hexagonal refuge spaces for the children to climb into and relax. These niches, built of wide grained Douglas fir timber, introduced biomorphic shapes, textures and materiality to the room, plus a sense of playfulness that encouraged the children to climb in and explore. Once inside the hexagon, the deep blue net effect carpeted surfaces noticeably softened the room acoustics. This created a distinct stillness that calmed the children – offering respite from the harder more reflective acoustic surfaces found around the rest of the school. This was an important feature, as many neurodivergent children can experience extreme levels of hyper-sensitivity to environmental stimuli, making loud noisy spaces uncomfortable and at times, distressing.

At the far end of the room, we used a vibrant grassy green pocket of Interface's Urban Retreat carpeting to zone an interactive area. Conscious that many urban children experience Nature Deficit Disorder we wanted to create a multi-sensory installation offering cause and effect interaction. It featured a series of hexagonal timber plinths containing 4 different push plates – each with a different surface texture: leaves, seashells, grass, and pebbles. When each is pressed a corresponding soundscape is emitted from a nearby speaker; the sound of a breeze in a tree; the sea gently lapping the shore; the sound of birdsong; or a riverscape. In addition, a coloured light illuminates the area to accompany the haptic and acoustic experience. The overall effect offering single or multiple layers of natural texture, soothing soundscapes, and gradients of coloured light.

Haia Ironside, one of the teachers at The Garden School commented "*The pupils come into the space and identify on a sensory level with all the different features in the room. It is evident that they are enjoying interacting with the space.*"

Photo credit: Interface

Photo credit: Interface

Haia goes on to describe the children's delight in the use of the space, and engaging with nature:

"*The first time we came into the space the children went directly into the hexagonal, cocoon-like shapes. One particular child, every time she's come in, she goes into that space. This is a child who actually seeks small, confined dark spaces, so it was fantastic to see her find something that fulfilled her need.*"

The garden school offered a wonderful opportunity to explore how a low maintenance yet highly beneficial approach to Biophilic Design could be delivered in an education environment – focussing on indirect connections to nature and our innate experience of space and place. When so much of spatial design is focussed on enhancing focus and productivity, essential components to the creation of learning environments are often overlooked; the opportunity to properly rest, relax and recuperate. The results speak for themselves, in the reaction of the children and the calm seen in the photos.

While perhaps the smallest of projects we have undertaken at Oliver Heath Design, the Garden School recuperation space is also undoubtably one of the most rewarding.

Find out more at
www.oliverheathdesign.com

Photo credit: Interface

Photo credit: Interface

Connecting the younger generations – Biophilic primary school De Verwondering

Gijs Bruggink, MA, LFA

Introduction

When we take a look at the kids of today we see them spending large amounts of time behind screens. TV's, computers, tablets, smartphones basically form their windows to the world. There seems to be an increasing separation between the natural world and the world in which our children grow up. Author Richard Louv describes the consequences of this separation as 'nature deficit disorder' in his excellent 2005 publication 'The Last Child in the Woods'. In short, he states that spending a large amount of time in sterile and understimulating environments that lack the enriching, inspirational and recovering effects of nature can lead to both cognitive and physical issues in children's development.

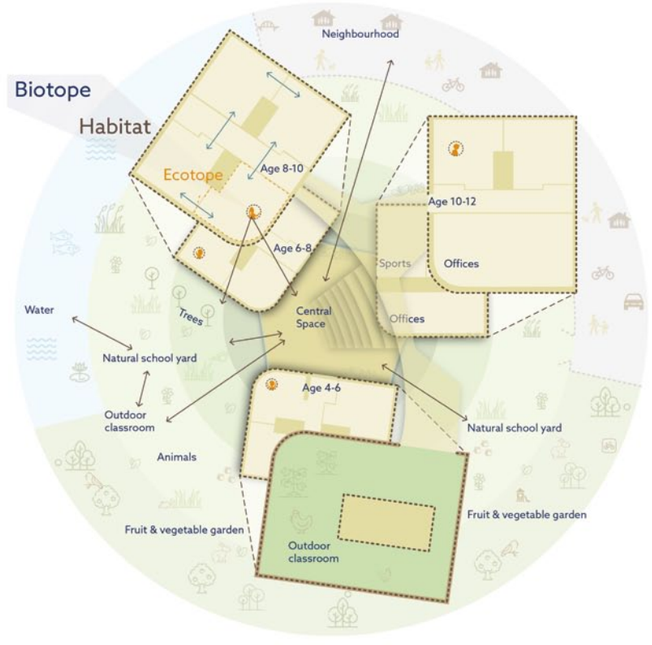
In addition to this worrying effect on a young person individually, we should also consider their roles as our future leaders and engineers. Will a person that grows up with little affinity with the natural world possess the sense of responsibility as an adult needed to take care of the planet?

These considerations led to plans for the creation of a new type of school building in the city of Almere in the Netherlands: primary school De Verwondering, designed by architecture firm ORGA. The name of school means 'sense of wonder' or 'amazement', referring to the sensation of curiosity in children that is triggered when they come into contact with the natural world. Any parallels with 'The Sense of Wonder', Rachel Carson's timeless publication from 1960, are coincidental, but both very much speak to the same sentiment.

Explorations

In the early stages of the project our design team found a lot of common ground with clients Prisma and the municipality of Almere. Their ambitions towards bringing nature into their education were clear and a biophilic exploration with the project team provided a great foundation for a holistic design process. Nature was going to play a big role in the educational programs and this was to be reflected in the space, appearance and material composition of the school building.

A great starting point for architects Daan Bruggink and Guus Degen who set two goals for including various connections to nature in the building design. Firstly, to create a healthy educational environment, beneficial for learning by triggering curiosity and a sense of exploration in the pupils. The second goal was to create more awareness in children and start fostering a sense of responsibility for nature as they grow up.



The school as a biotope

The way the spaces in the building work together is analogous to the system of natural habitats: shared spaces in nature that allow species to both thrive and coexist. Pupils spend most of the time in an 'ecotope' with children of the same age, the classroom. Three clusters of classrooms, including a small gym and an outdoor classroom on the roof form 'habitats' where pupils meet children of adjacent ages. A couple of times each day they venture outside of the familiar surroundings of the habitat, into the larger 'biotope' of the school complex. For example, to the central gathering area for school meetings or to the playground outside, where they can learn more about nature and the world.

Built from nature

The design offers a strong physical connection to nature with approximately 85% of the above ground construction of the building consisting of natural materials. The hybrid wooden structure is part timber frame and part mass timber, utilizing the specific advantages of each building method. All the insulation materials in the walls and roofs are bio-based, either wood fiber, flax or straw. Some of the interior walls contain a little window at kids' height, exposing the insulation and showing the pupils that the building is actually made from plants.

To both maximize the effect of the material and showcase all the different ways in which wood can be used, the use of paint or varnish was avoided. Natural oil finishing sufficed to protect the wood, bring out the textures and the grain and still allow the smell of wood to be present in the interior. The peeled tree trunk columns that support parts of the central area seem to hold special biophilic appeal as most passersby fail to resist the urge to run their hands over the smooth wood texture.

Multisensory

Nature not only has a visual presence in the interior of school. It's also there to be touched, smelled and heard, providing a more rounded biophilic experience. Climbing plants grow into green walls on both the interior and exterior walls and a natural ventilation system of hatches and roof vents cycles fresh air through the building, letting in the scents from the garden playground like freshly mown grass or the damp smell of rainfall.

Part of the lessons take place in the outdoor classroom or on the playground, regardless of the season or weather conditions. Different types of animals live on the schoolground and are cared for by the pupils. Planters on the playground are used to grow edible plants. All learning experiences that teach the children about the natural cycles of the seasons or that of growth and decay. And just as important, they learn that when you nurture and care for nature you're rewarded with beauty and produce.

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EDUCATION

In use

The building was completed in 2021 and the school's principal reports notable differences from their previous school environment. The children seem to really feel at home and love the playground. Teachers see that pupils are able to get rid of that excess energy exploring and playing outside, after which they are able to focus better on their schoolwork once back in the classroom. School attendance ratios have improved and there are a lot less signs of hyperactive behavior.

Although subjective in nature, these findings indicate a real potential for an education system that's closer connected to nature. Objective research confirms this indication. A study at the Green Street Academy middle school in Baltimore measured the effects of a biophilic classroom compared to a control classroom without natural features. Among other findings, only 35% of the students reported experiencing stress compared to 67% in the control group. Improvements in the math test scores over a seven-month period were over three times higher in the biophilic classroom.

Location

The many towns and cities spread across the flat landscape of the Netherlands have long histories. They date back to the Middle Ages or earlier origins as Roman settlements and have since then grown organically into the bustling urban centers of today. But not the region of Flevoland, the largest artificial island in the world. It was only 60 years ago that this 1400 km2 stretch of land was reclaimed from the Zuiderzee sea and turned into a combination of farmland and nature reserves with wetlands and forests.

Urban planners were now in the unique position to newly design the rapidly growing city of Almere from a 20th century perspective. This resulted in spacious green neighborhoods interwoven with waterways and small lakes, very different from the usual heavily urbanized Dutch neighborhoods like for example those in the nearby city of Amsterdam. In 2019, one of those Almere neighborhoods formed the backdrop for plans to build a new primary school, commissioned by school organization Prisma and the municipality.

A living building

Comparing De Verwondering school building to a natural organism isn't a huge stretch of the imagination. The structure provides its own energy from renewable sources distributed across the year using innovative buffer systems. A natural ventilation system lets it breathe on its own. The trees and living walls provide a protective layer of shade and greenery that changes along with the seasons. Similar to humans and some animals, the wooden facade will age and slowly turn gray. In short, the building will slowly but surely evolve following the natural cycles and, like many things in nature, it will only grow more beautiful over time.

Since completion, the building design and its biophilic concepts included have resonated throughout the world of sustainable architecture, winning several Dutch architecture awards and both the European and global Stephen Kellert biophilic design award in 2023. Our firm has been actively promoting (re)connecting to nature through architecture in publications and guided tours of the building. It's our sincere hope this design provides an inspirational example and many more biophilically designed school buildings will appear all around the world.

https://www.orga-architect.nl

Project information

- **Architects: ORGA architect, Daan Bruggink and Guus Degen**
- **Commissioned by: City of Almere and Prisma**
- **Advisor on education: Bladgroen, Evert van Kampen**
- Contractor: Van Norel Bouwgroep
- Structural engineer: Lüning
- Technical advisor: Nieman Raadgevende Ingenieurs
- **Interior design: Projectum**
- Landscape design: Goed Geplant
- Photographs credit photographer Ruben Visser.

Sources

- Richard Louv, *Last child in the woods* (2005)
- Determan et al, *The Impact of Biophilic Learning Spaces on Student Success* (2019) https://www.brikbase.org/content/impact-biophilic-learning-spaces-student-success

THE BENEFITS OF NATURE IN LEARNING ENVIRONMENTS

— CASE STUDY —

The Biophilic Classroom

Putney High School, GDST (Girls' Day School Trust)

Clare Bowman
Architect & Sustainability Advisor RCZM BSc (Hons) Dip Arch ARB RIBA

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David Bowman
Analyst BSc(Hons) MA

Suzie Longstaff
Headmistress (2007 to 2023)

Professor Derek Clements-Croome
University of Reading

Context

Nature in design is tangible, from the presence of a stimulating view of nature; or by using plants, natural air-flow or breezes. By mimicking the finer details of nature with textiles, artwork, light, shapes, materials, or patterns, we can re-create the biophilic human connection. This can often be seen as a challenge for schools and *our research has shown that the subtle reintroduction of nature can enhance the quality of learning environments to benefit health, productivity, cognitive and emotional wellbeing.*

Our research journey began in 2017, when while working on a sustainable campus masterplan for Putney High School (GDST), environmental surveys revealed the site benefitted from a natural setting which had 64 mature trees and 32 species, which could support: 300 insect species, 7 species of mammal and 15 bird species. This increased awareness of the nature in the area, refocused our approach to become a Green Infrastructure campus with an emphasis on;

- Access, sport, exercise and play in nature
- Views of nature and sky
- Improved air quality
- Improved humidity and freshness
- Moderation of temperatures and reduction heat island effect
- Increased Ecology biodiversity

The Green Infrastructure challenge was greatly welcomed by both the school and GDST (Girls' Day School Trust) who, as part of the schools' 'Breath Campaign', gave us the opportunity to deepen our understanding of the benefit of nature to support the wellbeing of staff and pupils aged 4 to 18 years.

As nature-based improvements to the external landscapes began, we moved our study indoors. We worked with the Head of Sixth Form and students and began a study into the impact of biophilic design within three sixth form classrooms throughout the academic year. The study focused on biophilic design to increase occupant connectivity to the natural environment using direct nature (plants) and indirect nature (murals).

The biophilic classroom study is based on 'The Flourish Model' of calming the mind in order for the imagination to thrive. The theory promotes creating a calm, natural and harmonious environment which will stimulate the alpha brain waves (high relaxation) and lower the high beta brain waves (high stress). In this manner the Flourish Model aims to calm the mind to improve attention and create the space for the imagination to thrive (Clements-Croome, 2018).

Method

19 indoor plants based on a 1 plant per 6 cubic meters equation that we developed were selected from the NASA study based guidance set out by Dr B C Wolverton in his publication 'How to grow fresh air 'and were selected basis of;

- Removal of chemical vapours
- Resistance to insect infestation
- Ease of Growth and maintenance
- Transpiration rate

The students selected Maths for 'Nature in Space' which was introduced in the form of plants, and English for 'Natural Analogue' which was introduced in the form of a woodlands photo mural. The classrooms were analysed in comparison with a third un-changed Geography classroom.

Air quality and comfort were monitored with fixed data loggers for temperature, relative humidity, and CO2. At the request of teachers further bi-weekly spot-meter readings were taken of indoor air quality (IAQ), formaldehyde (HCHO), total volatile organic compounds (TVOC), PM2.5 and PM10. I used spot metering every two weeks to check on plants and indirectly observe behaviour patterns and receive informal feedback with students highlighting '*Maths is so relaxing now*'.

Findings

With indoor and outdoor air quality a local public concern, I took the opportunity to take readings as I walked by-weekly to the school along the busy Putney hill, 15 meters within the campus which is treelined.

Within one month we had a clear picture that the plants were improving the air and that more importantly, we were able to report to the school there was no evidence of PM2.5 or PM10 found within the classrooms. The study showed that during the Winter Term the classroom with plants provided improved comfort by 10%, and humidity improved 8% above the 'natural analogue classroom'.

The study classrooms, located adjacent to a busy road in London, all benefit from views-out of mature trees, creating a natural boundary to the school campus, in the Spring Term. Working with the estates team, teachers and pupils, the passive ventilation system was re-set to act when CO2 reached 750ppm as prior research shows that CO2 levels affect decision-making when as low as 600ppm (Satish et al. 2011,2012).

Subsequent surveys found a significant improvement in consistency of comfort and 'freshness' essential for wellbeing. The spring to summer studies of 2019 of internal and external air quality surveys also revealed that the existing 15 meters deep mature landscape setting within the campus improved external air quality by an average of 23% above the adjacent road. The use of plants and a passive ventilation system set at 750ppm improved indoor air quality by an average of 58%. Presenting to the Head Mistress Suzie Longstaff, I held a plant up and said imagine this is a child's lungs. She often refers to it as a 'life changing experience'.


A Life on
Our Planet
CLEARING THE AIR

Use surveys were also undertaken using a Likert-scale questionnaire which we created based on ARUP Bus Methodology and NHS Guidance for wellbeing, developed to focus on perception of the design, occupant comfort, health, attention, cognitive and emotional wellbeing, and the introduction of biophilia. Further observational studies were also undertaken before and after installations using the Leuven scale for wellbeing, developed by Professor Ferre Laevers. For this I always sat in the same class so that I could become familiar with students and staff, who spoke of the 'love of teaching in the English room'.

Reviewing user surveys, we began to see a pattern emerge, the surveys revealed the use of plants had a closer association with occupant cognitive wellbeing, while the mural of nature was the preferred biophilic intervention, with a stronger relationship with emotional wellbeing. For the Headmistress Suzie Longstaff and Deputy Head Heidi Armstrong this was this was the moment the school shifted towards a biophilic campus-wide ethos which continues to thrive today.

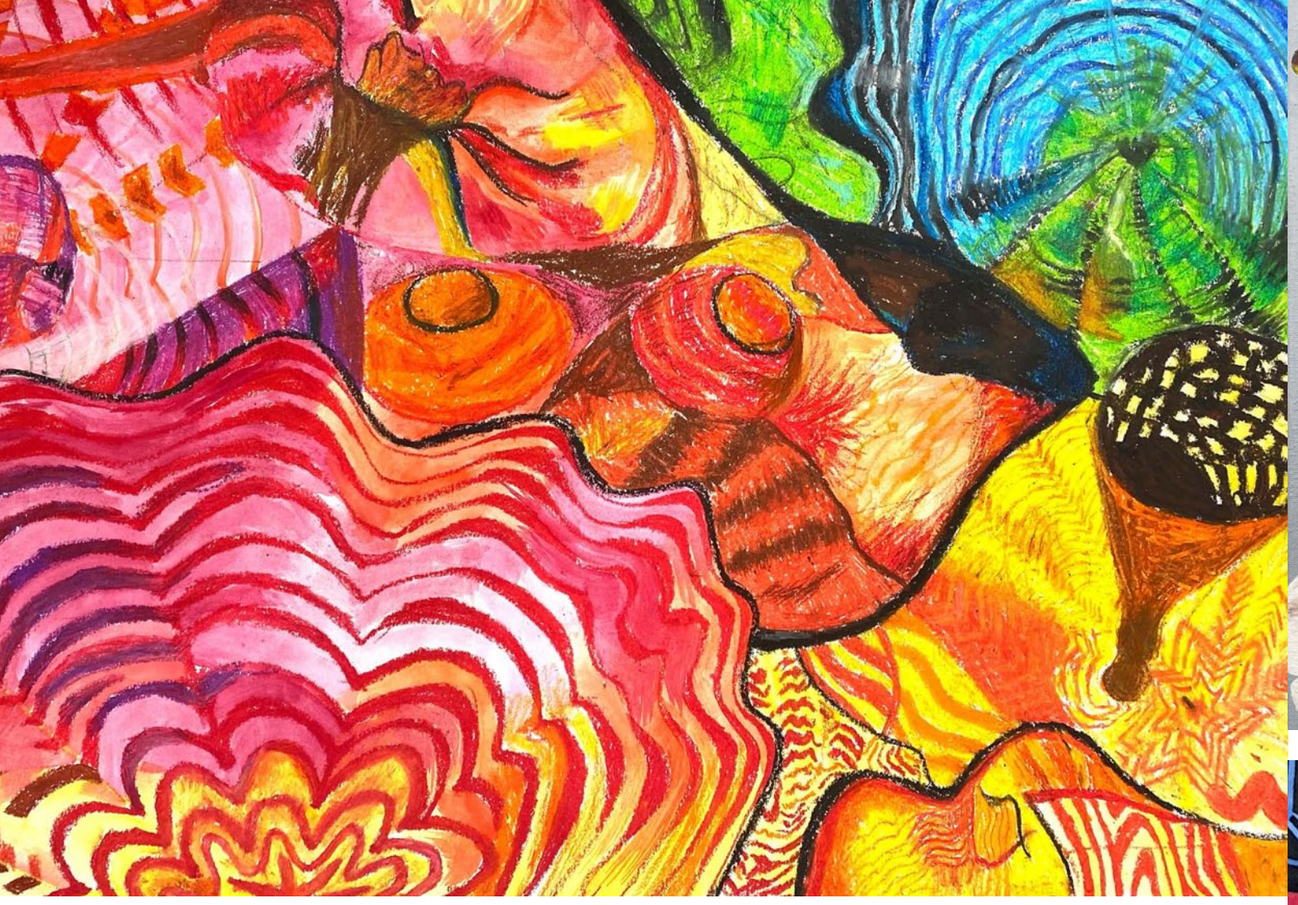
The road to RHS Chelsea 2020-2021

In 2020 our research was recognised by the Royal Horticultural Society, and we were invited to Exhibit our research in the Discovery Zone at RHS Chelsea, I designed a 360-degree immersive exhibit that could be relocated to the school and become 'Our Futures Hub', we were just weeks from the event when Covid- 19 hit. As the students left the school they did not know what to do about the plants, by this point we were ready to exhibit and had more than 150 plants, so the Head Mistress and I rescued them to our homes which became jungles, but we felt lucky, we were immersed in nature.

As restrictions lifted, we were able to refurbish a multi-use space and install our exhibit directly into the school. Then as lock down itself lifted, we shared the abundance of plants (which by now, many had produced babies!) across both the Junior and Senior School for everyone to enjoy. It was in the pupils' artwork that we also noticed a change. They chose to study and paint the plants during a challenging time and the use of colour and natural patterns began to fill the walls of the art studios.

You can see samples of the children's artwork on the following page

Left hand page top: Bella Howard
Bottom: Pia Tahta
Right hand page clockwise: Emma Ainsby, Amelia Goold, Allegra Galli-Zugaro



Without Chelsea we would never have created 'Our Futures Hub' and it has become the heart of the Sixth Form. We also grew in confidence and experience, so when we finally exhibited in the special September show, we were able to exhibit the students artworks and we created a Plant Guide For Schools to give away. Our guide focused on plants that could not just survive but also produce more plants.

We have reproduced the guide here in the Journal for you to use and share with your colleagues too. Please turn the page to view.

We made a film for the BBC with Arit Anderson in the August of 2021 with students who had been studying at home. It was their first return to school since November 2020. For filming we organised a series of workshops to enjoy in 'Our Futures Hub', it was very emotional and they described the space that it '*feels like home*'. Some sat down and just started drawing or potting up plants. The short film was aired as part of the BBC1 Sunday preview special and from the moment RHS Chelsea flower Show open we had a queue of teachers, academics and parents wanting to learn more and we gave away over 10,000 Plants for Schools Guides and our academic paper has been downloaded by more than 4000 academics worldwide. We were awarded an RHS Gold Medal and continue to openly share our sources and plant guidance.

3 years on Clare Bowman has created an updated list as the momentum for plants in schools grows.

http://www.rczm.co.uk

Further Reading
https://www.gdst.net/publications/the-biophilic-classroom/

Please turn the page for the "Plant Guide for Schools".

PUTNEY
HIGH SCHOOL
GDST

PLANT GUIDE FOR SCHOOLS

The Biophilic Classroom

The Benefits of Nature in Learning Environments

"It's not rocket science but we did get it from NASA"

LOW LIGHT

1a *Chrysalidocarpus lutescens* (Areca palm)
1b *Howea forsteriana* (Kentia palm)
Release moisture into the air and remove formaldehyde, xylene and toluene.

2a *Ficus elastica* 'Melany' (Rubber plant)
2b *Peperomia obtusifolia* (Baby rubber plant)
Remove chemical toxins from air.

3a *Dracaena* 'Janet Craig'
3b *Dracaena marginata* (Dragon tree)
Effective air cleaners removing xylene and trichloroethylene.

4a *Epipremnum aureum* (Marble queen, Golden pothos, Devil's ivy)
4b *Philodendron oxycardium* (Heart-leaf philodendron)
Remove chemical vapours.

5a *Chamaedorea elegans* (Dwarf palm)
5b *Zamioculcas zamiifolia* (Eternity plant)
Produce oxygen and reduce carbon dioxide at night.

MORE PLANTS THAT BRING DELIGHT FOR BRIGHT AND DIRECT LIGHT

Cereus peruvianus ('Florida' cactus)
Haworthia (White spider)
Senecio cephalophorus (Mountain fire)
Crassula ovata (Friendship tree, Jade plant)
Crassula (Buddha's temple)
Tillandsia (Air plant varieties)
***Echeveria* 'Doris Taylor'** (Woolly rose)
Echeveria (Purple pearl)
Echeveria agavoides
***Echeveria shaviana* 'Truffles'**

Putney High School's plant selections are all taken from a NASA study based on guidance set out by Dr B C Wolverton in his publication ***How to Grow Fresh Air***.

The plants were chosen on the basis of:

- Removal of chemical vapours
- Resistance to insect infestation
- Ease of growth and maintenance
- Transpiration rate

TOP LOW MAINTENANCE PLANTS WHICH THRIVE IN LEARNING ENVIRONMENTS

BRIGHT LIGHT

6a *Anthurium andraeanum* (Flamingo flower)
6b *Sansevieria trifasciata* (Snake plant)
Remove formaldehyde, xylene, toluene and ammonia. The flowers are a visual highlight.

7a *Aloe mitriformis* (Mitre aloe)
7b *Phalaenopsis sp.* (Moth orchid)
Effective in removing xylene from the air.

8a *Chlorophytum comosum* (Spider plant)
8b *Asplenium antiquum* (Japanese bird's nest fern)
Improve indoor air quality.

9a *Rhipsalis baccifera* (Oasis mistletoe cactus)
9b *Tradescantia zebrina* (Inch plant)
Improve indoor air quality.

10a *Pilea peperomioides* (Chinese money plant)
10b *Calathea ornata* (Prayer plant)
Improve indoor air quality.

PLANTS AND CARE

The selected plants enjoy fortnightly watering, and daily misting helps improve humidity which creates a fresher learning environment. Allow one plant per 6 cubic metres.

"**Putney High School's 'Breathe' campaign shows how a few simple steps can have a significant impact on both wellbeing and the ability to learn well.**"

Suzie Longstaff HEADMISTRESS

Indoor horticulture and external natural landscaping are sustainable improvements that can really make a difference. Even images of nature, along with subtle Biophilic Design principles, can refresh learning environments to bring restorative benefits, reduce stress, and improve focus.

Clare Bowman
Architect & Sustainability Advisor
RCZM & De Montfort University

Richard Bowman
Renewable Energy Consultant
Mesh Energy www.rczm.co.uk

Putney High School GDST (Girls Day School Trust) would like to thank: Professor Derek Clements Croome at Reading University, David Bowman, Will Wareing, Ivelina Ivanova, Gemma Gannon, Rochelle Morrissey and the Institute of Architecture, De Montfort University for their involvement in our research.

SUSTAINABLE SOURCES

- Landscape photography **www.matthewcattellphotography.com**
- Mural printing and installation **www.promoteyourschool.co.uk**
- Zero carbon carpet 'Human Connection' **www.interface.com**
- Adaptable bamboo furniture system 'Calvert' made in Cheshire **www.sixteen3.co.uk**
- Natural moss hand crafted in Cheshire and workshops **www.innerspacecheshire.co.uk**
- Biodegradeable,100% bamboo husk plant pots designed by Joe Hepworth and made in West Sussex **www.madewithhusk.co.uk**
- Hemp and flax woven British fabric **www.camirafabrics.com**
- Plants grown in Holland by Nieuwkoop, selection and guidance The Palm Centre, Richmond **www.palmcentre.co.uk**
- Cacti and succulents grown in Surrey **www.ottershawcacti.com**
- Air plants grown in Cornwall **www.andysairplants.co.uk**
- Wooden plant markers **www.sophiavictoriajoy.com**
- Botanical terrariums and workshops in London **www.botanicalboys.com**
- Eden Project 'Canopy Closed Garden' 100% recycled and handmade glass range created by **www.lsa-international.com**

Refreshed, Energised and Happy

"A personal experience of a 5-acre oasis of verdant nature "rooms", ignited in leading architect Jim Determan a desire to make humane space; spaces that have a positive impact on people, so people can have a positive impact on others. He goes on to share how he designed a beautiful school applying these principles."

Jim Determan, FAIA

During the 2009 American Institute of Architects (AIA) National Convention in San Francisco, a group of architects decided to take a walking tour of the city. We wandered up and down the steep hills of SF seeing the sights. After many hours, my knees were done, my head was aching, and I decided to head back for a respite. Surprisingly, my colleagues coerced me into one more tour – the Japanese Tea Garden in Golden Gate Park. I was promised we would sit, have tea, rest. We did not. We strolled the 5-acre oasis of verdant nature 'rooms'. The grounds are filled with blooms, ponds, lily pads, and moss. We experienced the crunching sound of tiny pebbles, the fragrance of the woods, the little stones nestled up to big stones, and the lush composition of nature's textures, colours, spaces, light, shadow, sounds, forms, shapes, silhouettes, habitats, pagodas, lanterns, bridges, and a very calm duck. We did not sit. We had no tea. And after 90 minutes, I was cured.

Refreshed, energised, happy.

That experience ignited a desire to make humane space; spaces that have a positive impact on people, so people can have a positive impact on others. I am an architect who designs learning space. I cannot think of a more important group to receive the benefits of humane design than young learners. But can design make an impact on student mental health, improve behaviour, or enhance learning? The tea garden experience was a call to reveal these answers. I began reaching out to like-minded collaborators – universities, scientists, artists – to conduct research that would help us understand the impact of biophilic design on students.

Research

The most recent study, *The Impact of Biophilic Learning Spaces on Student Success*, published by the AIA in 2019, was created by a partnership of Craig Gaulden Davis Architecture, Morgan State University, The Salk Institute and Terrapin Bright Green. During a 1-year experiment, we examined the differences in stress and learning outcomes between a biophilic classroom and a control classroom of 6th grade math students at Green Street Academy in Baltimore.

The biophilic classroom contained three design strategies.

View to nature A garden was planted outside the classroom windows.

Diffuse and dynamic daylighting The opaque mini-blinds were replaced with a translucent Mecho shade so soft light could always stream through. The fractal pattern of tree shadows was printed on the shades. Shades were motorized and controlled by a solar cell, allowing the teacher to teach and not be responsible for daylight and view.

Biomorphic Forms and Patterns Interface carpet tiles provided a prairie grass pattern. A frieze with a biophilic pattern, was placed above the white board along 3 sides of the room. A 3-D felt carved wave ceiling tile ran along the front of the room.

Using interviews, surveys, stress monitoring and learning outcomes, we compared data from the biophilic classroom to the control classroom and found a significant association between biophilic design, student stress reduction and improved learning outcomes.

The students' perceptions of the class environment were significantly more positive in the biophilic room. They said they were "better able to focus", the room "calms me" and "relaxes me". The teacher said, "Oh this is peaceful; other teachers come in here to calm themselves down".

Stress testing was done with biometric screening. A finger meter measured the student's heart rate variability for one minute during the first and last minute of each class enabling us to quantify stress reduction from their experience in class. Students were significantly less stressed in the biophilic classroom. Stress reduction increased each month reaching its maximum in April. We asked the teacher what happened in April. She said, "it's spring, everything starts to bloom". Students could see the garden from their seat. The control classroom, like many classrooms, typically had closed blinds.

We compared the learning gain from a standardized test given three times per year in both classrooms to 125 6th grade Math students. The average learning gain in the biophilic class was 300% better than the control class average gain. I recall the teacher telling us that when the students took their state exam they voted to face the windows.

This pilot study found a significant association between biophilic design, student stress reduction and improved learning outcomes.

The full study is available
here for download:
https://cgdarch.com/knowledge/

CASE STUDY

Application

Following the study, my colleagues and I were excited to apply biophilic strategies to the design of a new school, Bethel-Hanberry Elementary School (BHE) in Blythewood, SC.

Students enter a tall daylit space with wood panels above and coloured biomorphic shapes dancing along the walls. Prospect helps students feel safe as they can see through the perforated risers of a blue stair out to a courtyard.

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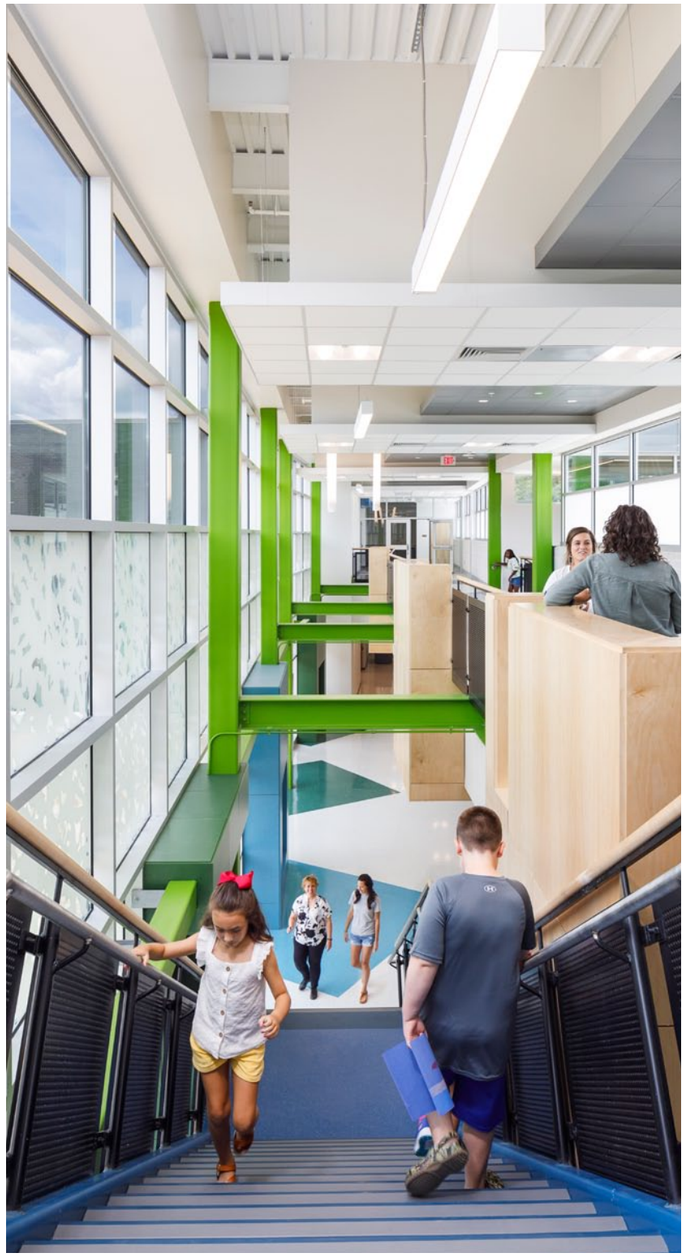
Students walk through the shadow of a 'canopy of trees' cast by a frit pattern on the west glass along the main corridor.



Students walk through the shadow of a ‘canopy of trees’ cast by a frit pattern on the west glass along the main corridor.

Collaborative learning spaces are tall, open, and full of daylight with views to nature. Transparency from classroom to collaboration space helps students feel safe knowing what is happening outside their classroom.

Journal of Biophilic Design
EDUCATION

Collaborative learning spaces are tall, open, and full of daylight with views to nature. Transparency from classroom to collaboration space helps students feel safe knowing what is happening outside their classroom.

In the library, the grand scale, floating biomorphic forms, and panoramic views intend to produce the 15th biophilic pattern, Awe.

Summer Allen, in *The Science of Awe*, writes, "Experiencing awe often puts people in a self-transcendent state where they focus less on themselves and feel more like a part of a larger whole. . . . When it comes to psychological effects, studies have found that awe can . . . increase feelings of connectedness, increase critical thinking . . . increase positive mood. . . . Multiple studies have found evidence that experiencing awe makes people more kind and generous."

Assessment
Now, after the first year of occupancy at Bethel Hanberry Elementary School, we are assessing the effectiveness of these applied design strategies and comparing them to similar metrics from last year in the old school. The assessment is not complete, but we have some early findings.

Perceptions Survey participants agree that biophilic design strategies make a positive contribution to the learning environment.

Parents 95%	Students 82%
Teachers 93%	Administrators 100%

Absenteeism Out of 20 elementary schools in the district, BHE is tied for having the greatest reduction in chronic absenteeism, (missing 10% or more of the school year), reducing from 17.3% (last year) to 12.3% (this year). The National Center for Education Statistics reports the national average of chronic absenteeism is 17% and the SC Department of Education reports an average of 24.73% for the 2021-22 school year.

Behaviour The Assistant Principal reports that there are fewer disciplinary problems this year as compared to last year. "There's been a decrease in the overall number of referrals and the intensity of the infractions. I think the sense of calm that's promoted throughout the building makes a difference. And I think it manifests in the behaviors that we do and do not see."

Learning Outcomes MAP (Measures of Academic Progress) testing measures student growth in Math and Language Arts/Reading and compares student growth from one year to the next. The Bethel Hanberry MAP scores in Math indicate growth exceeded projected growth in every grade. The Language Arts/Reading scores exceed projected growth for grades 2-4 and met projected growth in grade 5. Principal Holland describes the academic performance improvement the first year in the new school as "fantastic and highly motivating!" It is amazing that we met all and exceeded seven of eight growth projections. This is a great accomplishment which we celebrate and are energized to continue. This is remarkable in the context of a 2023 NAEP report that scores have declined in every course nationally.

While we don't claim biophilic design strategies are solely responsible for the student success described in this assessment, given the research, and survey results, we believe biophilic design made a powerful contribution.

Conclusion
From research experiments to real world application, we see the benefits of biophilic design in learning space. Think of the impact. If minimal design interventions in the classroom can help make students happier, healthier and improve learning, why wouldn't we do this in all schools? Every effort to help improve a young person's capacity to learn and to enhance their social-emotional wellness will pay dividends to them as individuals and for us as a society.

Using biophilic design expands the tea garden experience and turns it from a unique, once in a lifetime encounter to becoming a foundational strategy to enhance learning and give students every advantage as they begin their life journeys.

cgdarch.com

The full study is available here for download:
https://cgdarch.com/knowledge/

JIM DETERMAN, FAIA is Principal Architect of **CRAIG GAULDEN DAVIS**

Worlds First Art Therapy Pod

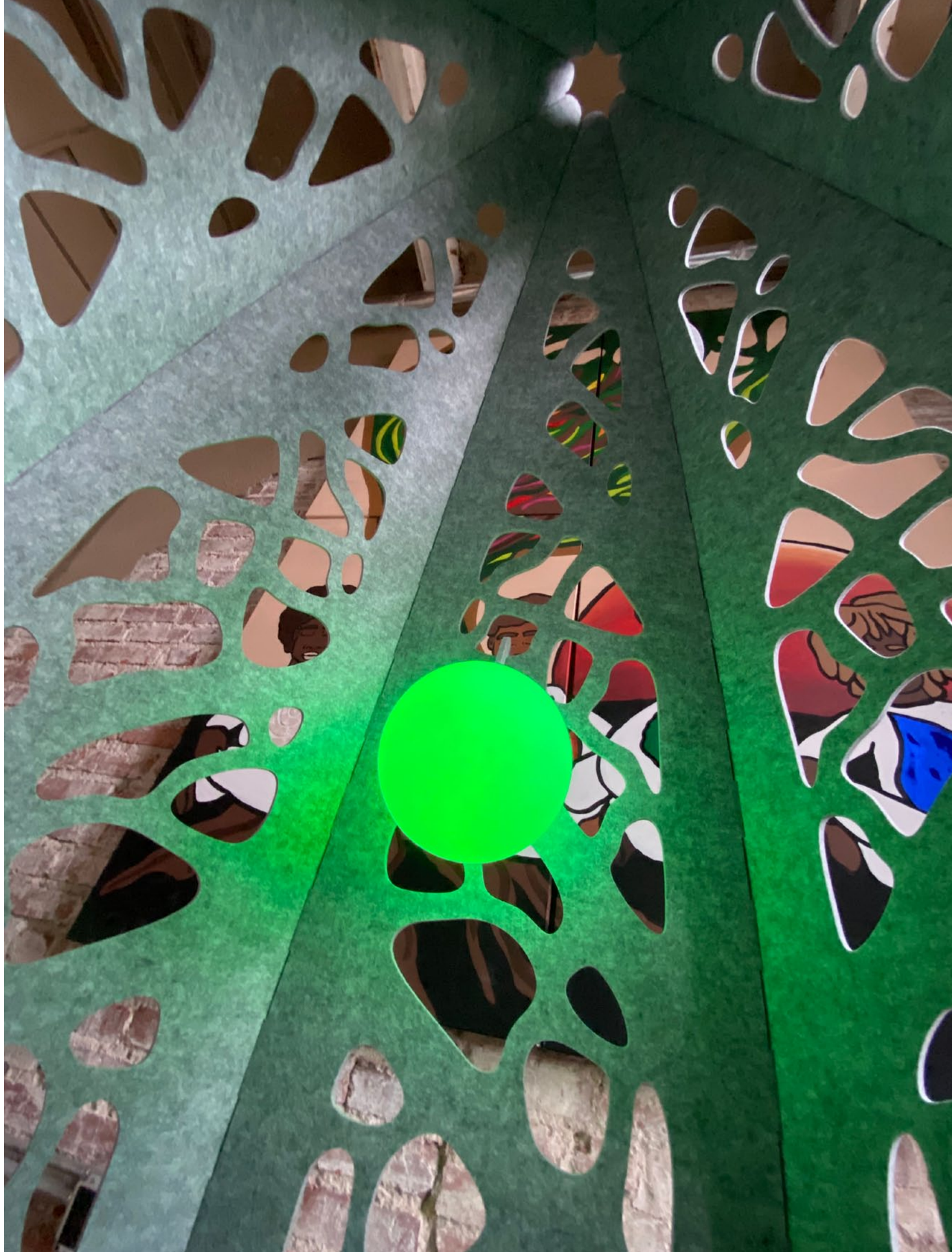
"I believe that whatever the brief, Biophilic design is the answer. Humans are co-evolved with the natural world, and so building our spaces, objects and interactions in harmony with this knowledge produces work that truly has the power to make humans feel better, and by better I mean less stressed, more joyful and more creative."

Freyja Sewell

Creativity was the focus for the design of the world's first Art Therapy Pod, masterminded by the brilliant Ebony Easiley, founder of Art4orms, Tulsa. The Art4orms Foundation exists to build and sustain generational access to art education for public school students. It utilizes art education to expand career pathways and dismantle historical disadvantages placed on communities of colour. I was full of joy to be able to bring my education and experience in Biophilic design to this space and mission.

Ebony approached me with a beautiful brief, to create a dedicated Art Therapy space for the students to enter into a different world, a world that nurtured their creative impulses and provided relief from stresses and distractions. We enjoyed discussing the power of agency in the forest. In the forest, and other natural spaces, children are able to change the world around them, to kick up leaves, construct forts, draw in the dirt. This is the absolute opposite of most educational spaces, where the rules are more often, don't touch, keep in line, don't change anything. We wanted to create a space where the children could experience more control, to choose what they watched, or heard, or smelt.

The resulting set of pods are designed to be customisable. Tactile spray bottles are used to allow for olfactory exposure. Mix and match video and sound channels can be easily controlled via a simple iPad interface. The lights are wireless glowing spheres, which can be moved around and even thrown, there are many decentralised controllers to allow the children to choose the colour and brightness. There are even felt pebbles on the floor, which the children are encouraged to pick up and play with in whatever way they want to. Different sizes of pods are available, allowing the children to choose whether they want to be alone or in a group. The project is an ongoing exploration, with new content for the video projectors generated through co-creation sessions set to be installed soon.



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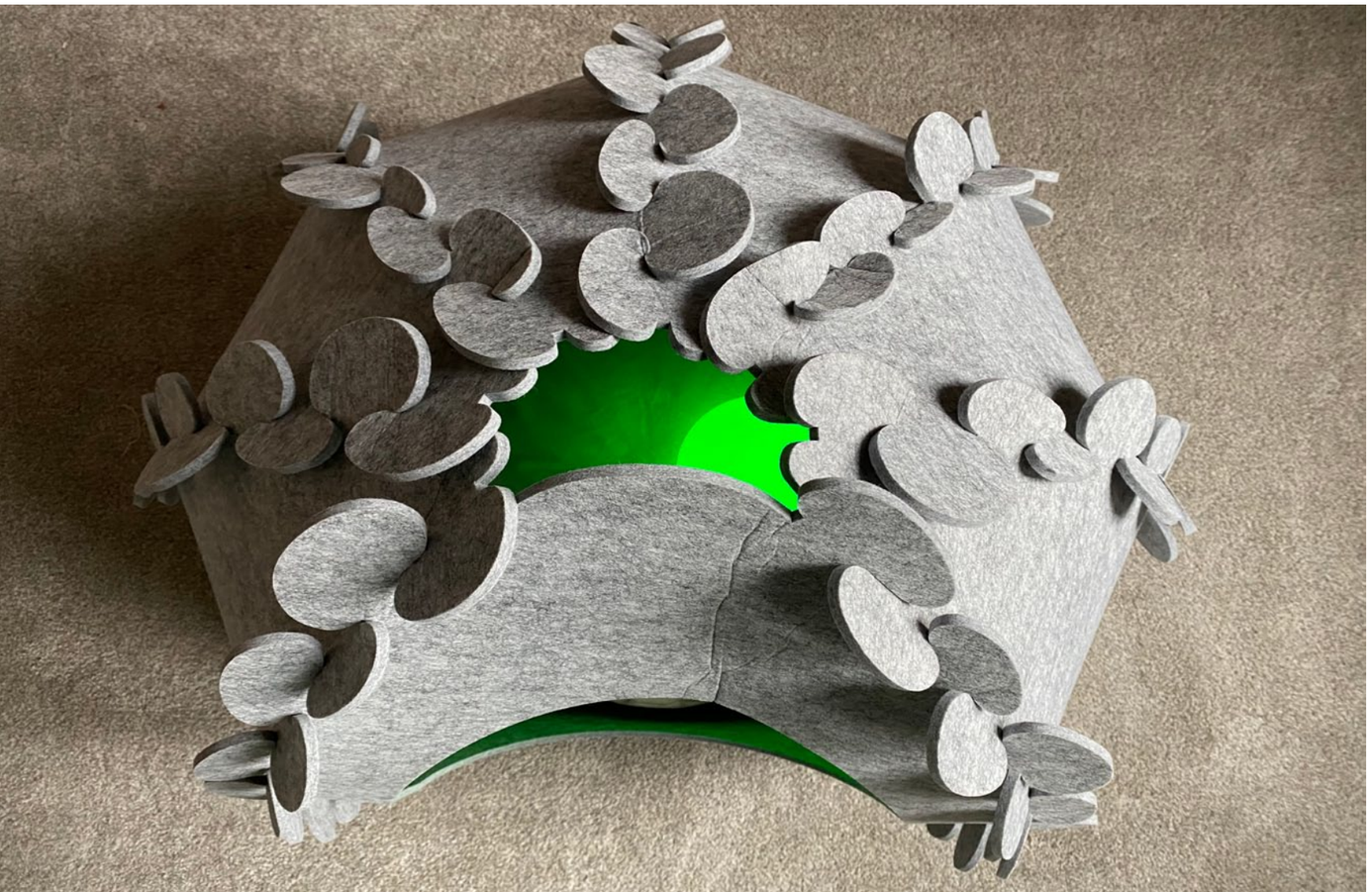
The form uses classic Biophilic design principles, inspired by the micro detail of leaves, and the macro feeling of being held and protected by a circle of trees. The centre table with inbuilt interactive lighting provides a focal point to gather round, reminiscent of the firepit on a camping trip.

The design also employs one of my favourite Biophilic design tools, Soft Fascination, the intentional creation of mystery and interest through partially obscured fields of view, the patterns cut into the sides of the pods allow the children to peek out, to observe the world whilst still feeling protected and private.



Was the project successful? Well, on the opening night the main problem we had was having to constantly gently remove children from the pod to make room for visitors, they simply did not want to leave. Adults might flatter and dissemble, you can never be quite sure whether they mean what they say, but the actions of the children on that opening night was one of the greatest compliments I have ever received.

I look forward to seeing and learning more as Ebony and her team explore and test the space, bringing in professional Art Therapists to develop programs and expanding the work they do, and I am so excited to continue to bring the power of Biophilia to this critical educational space.

freyjasewell.co.uk

UNIVERSITIES ARE WORKPLACES TOO

Rachael Pashley

"As a designer I have always been drawn into the natural world for inspiration and enjoy surrounding myself in Nature. From growing up in the Derbyshire countryside and moving to Cornwall to study and then making it my home, I have always appreciated natural environments and the beauty of materials, patterns and shapes and the way it makes me feel."

Its not surprising that when I work on a design concept, I love to draw from this nature inspiration. In 2020 I was commissioned by MWJV to be part of a team to deliver the new Immersive Business space at Penryn campus. Led by Falmouth University in collaboration with University of Exeter, Immersive Business facility was designed to enable SMEs in Cornwall and the Isles of Scilly to compete nationally and globally through the development and application of immersive technology innovation. It was part funded by the European Regional Development Fund.

Immersive Business is a unique immersive technology facility where businesses can access and benefit from virtual reality, augmented reality, and mixed reality technologies.

CASE STUDY

My interior brief for this project was to create a multi-use workspace reflecting the vision and ambition of the new technology that they intend to develop.

In reality the most immersive people feel is whilst in water, the overall colour palette reflected this together with using bespoke graphics and textures, we designed a vinyl graphic with a patterned gradient, the fragments or 'digital' shapes we placed to give the impression of a reality and VR transition, it was also used as part of the overall branding of the space.

I was really keen to use planting throughout the office environment to soften this otherwise sterile space, but also to make people feel they were in real life as opposed to VR which they were testing.

The meeting room again was the perfect space to do something special to reflect this. I designed a bespoke ceiling feature using freeze dried foliage, together with the supplier we created a jungle canopy over the meeting table with a LED linear array top and bottom which provided direct lighting on the working plane and uses reflected light to light the jungle ceiling feature. The foliage manufactured & supplied by Innermost in the UK is freeze dried, 100% natural and uses only sustainable materials. There is no maintenance required so makes it the perfect product for workplace. This was at the time a bespoke design for this project but since then it seems the canopy is a standard product the company offers.

I think more and more, especially post-Covid clients and staff are wanting a more "working-from-home" environment, one that's comfortable yet inspiring space to be in, many of the briefs we now get is to entice employees back to the office and to really consider the well-being of the staff as priority. We started this project before Covid and it was completed during. It was ahead of its time in that we had already considered the way people should feel in the workplace drawing from nature to achieve this and using biophillic design as the forefront consideration in all our projects. It was very well received from the client who commented to say '*We are loving spending time in this space. It has such ambience*'.

An earlier workplace project completed in 2019 at Falmouth & Exeter university was designed as a co working environment. The key areas we focused on were Social Breakout, Meeting, Collaborate & Connect, Quiet Working and a more specific coding zone. We used a mixture of sustainable materials, patterns and textures to create a unique identifiable space which will be robust to last for many years to come. As mentioned earlier we aim to design with biophillia in mind on all our projects, promoting the natural world which is so important in the digital age. We used sustainable freeze-dried moss again by @ innerspaceian above the tea-point to add a striking impactful natural feature, with LED strip lighting at the base to uplight the moss. With the tall ceiling in the room, it really helped make this space feel more comfortable and inviting as well as help soften and add better acoustics.

Rachael Pashley, BIID Registered
Interior Designer, Director and Senior
Interior Designer at Quay Studio

https://www.quaystudio.co.uk

The Awen Project

"The Awen Project is pioneering a new model for learning environments: where young people are championed to be themselves and follow their passions as active participants in a democratic community."

We work with families to co-construct small, free-to-attend learning communities, that are run by the students and have ethics of excellence, entrepreneurialism and deep creativity.

Following the most up to date research on how humans learn whilst allowing each Awen Learning Community to independently reflect the needs of its community, geography, and future job markets, we will build a large network of Tribes that will cross borders, sharing resources, staff, and learning opportunities, and supporting generations of young people to become healthy, informed, and responsible members of the global society to face a future that is going to require great things from them.

Our hope is:
To demonstrate that a learning community can be built and maintained by children and their families both physically and spiritually, and financed in part through entrepreneurial ventures developed by the students. Providing an education driven by passions and necessity, adaptable to technological and cultural changes, through which children and young people will feel a true sense of ownership over their learning.

Visit https://www.theawenproject.com

Photos credit: Jonny Field

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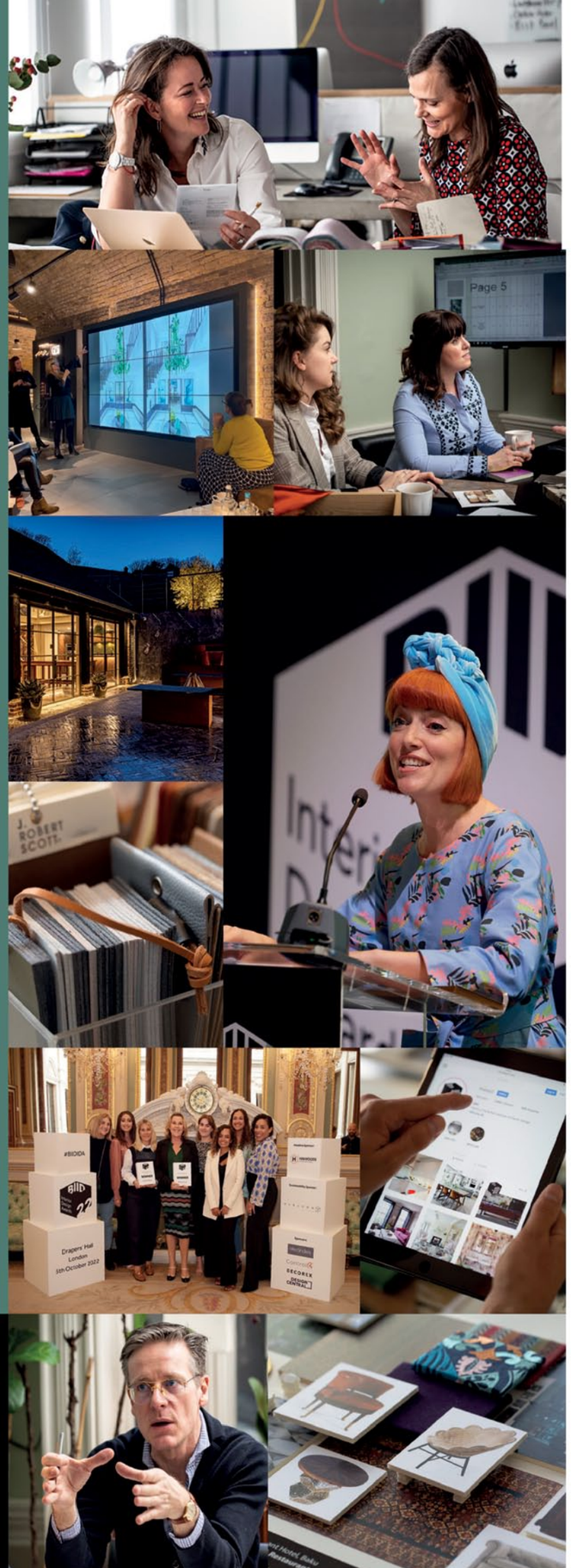

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INTERNATIONAL WELL BUILDING INSTITUTE™

Connecting Building and Landscape

— CASE STUDY —

"To champion low energy and nature based development solutions, the new Merstham Park Secondary School was earmarked by the Department of Education to act as a template exemplar school for low carbon technologies and biophilic landscape provision."

Nicholas Atherton

The proposed scheme, a few miles north of Gatwick airport, establishes a very close relationship between building and landscape for the benefit of climate impact and wellness. The building implements an air source heat pump-based heating system, extensive photovoltaic panels, air leakage reduction technology, high specification glazing, heat recovery and air re-circulation to reduce energy consumption.

The landscape design was guided by the DfE's aspiration to make the grounds an integral part of the school experience and create an eco-centric landscape which responds to biophilic design principles in reflecting natural systems, symbols, textures, and tones for psychological, physiological and spiritual replenishment whilst adapting to the current emergencies of climate change, flooding frequency and biodiversity depletion. The ambition was to develop the grounds of the school so that they became an exemplar proponent of the wellbeing impacts biophilic design could have on students and teachers at the school, integrating into practice, evidence for the beneficial effects of exposure to nature in research


Success
Respect
Resilience
Collaboration
Inclusion

Natural Dimensions Ltd were commissioned to produce the detailed landscape design and construction information after we produced a successful Landscape and Visual Impact Assessment. **The designs encourage human/nature/outdoor interdependencies to develop within a pedagogic environment. We focused on progressive design geometry, creating urban nature with woodland, specimen trees and ground cover matrices with close adjacencies between social spaces and planting.**

The adjacent greenbelt is extended in a physical and sensory way up to the edges of the school buildings, with views to the southern playing fields filtered by extensive windbreak planting bringing woodland closer to the school with long grass margins and smaller copses.

We used a design language to envelop the school which is borrowed from natural patterns to incorporate symbols of nature into the patterns of the design whilst still providing the necessary durability and safety requirements for school social spaces. Symbolic references and contoured landform, naturally textured surfaces and flowing movement were introduced to stimulate and enhance sensory connection with the natural environment.

A key fundamental which underpins the design is the intention that nature appears to be wrapping around the site and the school building to create a natural envelope distinct from the street environment.

Views to the building elevations are filtered extensively by trees and ground layer planting. Tree planting close to the building brings a canopy layer to the experience of walking around the school and also provides shade in summer months to reduce solar gain. A sequence of planted mounds along the western and northern elevations help to sink the building into the ground and make it appear nestled into its environment among flowing topography and planting. Greenery is a constant backdrop feature from the school rooms.

Special attention was given to incorporating a green envelope around arrival points and arrival pathways. We wanted to create a very strong sense of transition from the street into the school with the planting becoming an immersive experience as you passed through the gates to create a distinct change in atmosphere as students entered the school grounds. We wanted the journey from the entrance gates to the school building to alter the mood of the students as they entered the school building.

At the centre of the northern entrance composition is a memorial garden dedicated to the memory of Martin Beard, the former head of the school, who passed away prematurely near the start of the school planning phase. The memorial garden contains an array of transparent coloured glass panels inscribed with the values he stood for which appear above the planting as an artistic reminder of the school values to the those entering and exiting the school. **The garden was designed as an outdoor classroom with textured timber cube seats to provide opportunities for seated reflection within.** Spiralling out from the garden are bands of planting reaching out and curving around the entrance to embrace arrivals.

Planting is naturalistic in style and intended **to enhance sensory connections with natural rhythms, colours, and textures.** Planting mixes are in matrices which provide year-round structure so that even in winter the skeletons of the grasses and perennials remain as an attractive upright feature. Planting is selected so that their flowering displays coincide with the school terms and create a constantly changing tapestry of colour and texture which responds to seasonal change. The use of ethereal grasses in combination with perennials laid in organic patterned bed structures and contoured landform creates a strong place identity with significant ecological diversity. Allotment beds and an orchard garden are also introduced to allow urban agriculture, herb and vegetable growing for the school kitchen and the wider community.

A large plaza to the rear of the school is the school's main **social space.** The design language of the courtyard is a thematic extension of the curving organic language through the rest the scheme. The greenery from the landscape to the south of the school flows into the courtyard on large islands of planting in organic forms containing trees, grass and groundcover planting and act as green social spaces in themselves. The courtyard design provides a central plaza space and stage edged with bespoke seating. Smaller sub spaces around the edge of the plaza are each set into their own pockets of space and surrounded with planting. A large curving band of planting separates the central plaza space from an outdoor dining space next to the dining hall. The space is covered by a bespoke designed timber canopy which takes rainfall along specially extended legs into the curved band of planting.

Permeable paving has been used for all paved areas and permeable tarmac for all vehicle areas. This allows surface flows to be gently absorbed through surface materials, reducing surface flow. Sustainable urban drainage has been promoted throughout the scheme. A storage tank under the courtyard collects water and re uses it for irrigation and grey water use.

The design is intended to create a truly special and unique learning environment which is commensurate with a modern understanding of the importance of interacting responsibly with the environment and which acknowledges the positive physical and mental effects of interacting with and stewarding the planet's natural systems.

https://www.naturaldimensions.co.uk

From Surrealism to Biophilia to Well-being

"The place you study, the environment, and the ethos behind it play an important role in building creativity, focus, ambition, inspiration and ultimately outcomes. West Dean College is one of the greatest examples of how the vision of one individual to reconnect people to nature-inspired design and artisanal crafts continues to leave a legacy of appreciation and the nurturing of traditional skills in a beautiful natural setting. Here we learn about its founder and the events and foresight that led him to create West Dean College"

Geoffrey Makstutis Head of KLC School of Design, West Dean College

Hidden in the heart of West Sussex (about two hours south of London) is a place where you can stroll through formal gardens, walk in acres of woodland, visit a unique manor house (parts of which date back to the early 17th century) filled with art and objects; ranging from 15th century paintings to Surrealist masterpieces. In addition, you could spend a day or a week learning to do watercolour painting, basketmaking, tapestry, creative writing, gardening, metalworking, photography, woodworking, printmaking, jewellery and much more. Or, if you have more time, you could do an undergraduate or postgraduate degree. All of this takes place at West Dean College, the vision of the unique mind of Edward James (1907-1984).

Edward was fifth child and only son of William James and Evelyn Forbes. The James family had achieved great wealth, in the United States, through copper mining and timber; while Evelyn Forbes was the eldest daughter of Sir Charles Forbes, 4th Baronet of Newe. This was a marriage of wealth and station, and Edward's early life was filled with visits from royalty, aristocracy and tales of his father and uncle's adventures as explorers.

Edward James' education was very much in the tradition of an English gentleman of the age, studying at Eton, Le Rosey in Switzerland and Christ Church College Oxford; although he left Oxford without obtaining his degree. While he had inherited the West Dean Estate, upon the death of his father in 1912 (and a sizeable trust on the death of his uncle, John Arthur James, in 1917) it was only upon reaching the age of majority, in 1929, that he came into control of the wealth of the estate. And, it didn't take long for Edward to begin his journey to become, in the words of the BBC Arts, "The greatest English patron of art of the early 20th Century."

In addition to publishing his own writings, his imprint published Betjeman's first collection of poems (*Mount Zion or In Touch with the Infinite, 1931*) and it was in the early 1930's that he began his lifetime relationship with Surrealism. He not only developed one of the world's most outstanding collections of Surrealist art but became an active participant in the movement. His collaborations and commissions with Salvador Dali resulted in the iconic "Lobster Telephone" and "Mae West 'Lips' Sofa", as well as furniture pieces for his second home at Monkton House. His last project, with Dali, was the *Dream of Venus* pavilion for the 1939 New York World's Fair. His relationship with Rene Magritte resulted in a number of well-known 'portraits' of James (*Not to Be Reproduced* and The Pleasure Principle, both from 1937). James was editor and sponsor of the Surrealist magazine, *Minotaure*, throughout the '30s.

By 1939, Edward James was beginning to grow concerned about the potential loss of traditional arts and crafts. With the war in Europe raging and continued industrialisation James feared that there would be less and less call for and opportunity for art, design and craft to have a place in the modern world. In a letter to Aldous Huxley, James set out his dream:

> "*...to establish an educational foundation where creative talents can be discovered and developed, and where one can spread culture through the teaching of crafts and the preservation of knowledge that might otherwise be destroyed or forgotten.*"

Journal of Biophilic Design
EDUCATION

In 1944 Edward James made his first visit to Mexico and this became, increasingly, where he spent more and more of his time. Here he became a close friend and patron of Surrealist artist Leonora Carrington who he supported and collected until the end of his life. He also became friends with Plutarco Gastelum, who worked in the local telegraph office, and would become one of the most important relationships in Edward James' career and life.

The natural world had been an important part of James' life from the beginning. On the one hand, he was the owner of a 6500 acre estate in West Sussex that included forests, farms, livestock and wildlife. At Monkton House, he kept peacocks and had built them their own extension to the house. He became somewhat notorious for travelling with a number of exotic birds that he would keep in his hotel rooms. Throughout his later life, there are numerous photos of him with a parrot or toucan on his shoulder.

In 1947, James and Gastelum purchased a parcel of land near the town of Xilitla, in the Mexican state of San Luis Potosí. In this mountainous area, James created a semi-wild garden and populated it with a variety of animals including deer, macaws, snakes and more. As James spent more and more time in Mexico, living in small shack on the site in Xilitla he became closer and closer to both the people and the natural environment.

In the 1960's, following a devastating storm that destroyed much of the planting that had been done, he embarked on a major project to create a new form of garden, which came to be called *Las Pozas* (The Pools). To fund this endeavour, James sold much of his Surrealist collection. For the next 20 years, James; working with Gastelum and a growing army of local craftspeople, created a Surrealist fantasy at Las Pozas. Often working with just rough sketches that James had jotted on odd pieces of paper, the local workers created 30 concrete structures that recall natural forms, classically-influenced columns and arcades, pools and waterfalls. Today, Las Pozas is a UN World Heritage Site and is often considered one of the most significant examples of Surrealist architecture. It remains a place where people, wildlife, and nature come together in joyous symbiosis.

While Las Pozas stands as Edward James' most significant work, his legacy is also maintained through the foundation he established in 1964. The Edward James Foundation established West Dean College in 1971, finally bringing James' ambition to reality, as articulated in his letter to Huxley some 32 years earlier. Located at West Dean House, and (since 2021) in London, the college has offered a range of courses in fine art, conservation and, most recently, interior and garden design. In addition, the college offers a tremendous variety of art and craft-based short courses to the public.

On any given day, at West Dean College, one may find guests engaged in lithography, silk flower-making, tapestry, life drawing, jewellery making, blacksmithing, interior design, painting and much more. And, when having lunch and listening to the conversations among those present there is a common refrain that relates how 'making' and engagement with 'craft' makes the individual feel better and that this shared experience is enriching.

From wealthy patron to eccentric builder to environmental creator to art, design and craft champion, the legacy of Edward James has become one of well-being through nature and tradition.

https://www.westdean.ac.uk

Geoffrey Makstutis
BScArch AADipl PgCertHE RIBA ARB
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Head of School of Design

Aalto University and their ‘green’ learning environment

“Aalto University strives to create a ‘green’ learning environment. Green both in the sense of being eco-friendly, with a firm commitment to achieving carbon neutrality, and also because it is physically green – with a nature preservation area and a bird-watching tower right next to the main campus in Espoo, Finland.”

Satu Kankaala

According to Alvar Aalto, the prominent Finnish architect and namesake of Aalto University, “*Nature is not artificially constructed, but the city should be brought into nature with consideration to existing greenery and light conditions.*”

The Aalto University campus natural capital survey states that nature enhances an area’s economic value and contributes to people’s wellbeing. For campus users, walking in the woods has been found to reduce stress and lower blood pressure. Carefully mapping the campus space has allowed Aalto University to maintain biodiversity as well as the recreational value of the forest and other green spaces.

The Campus Development Plan 2030 provides direction for the future development of these areas, ensuring that next steps are in line with the university’s strategic goals – to strengthen the campus’s identity, brand and sense of community while also making facilities more sustainable. The plan is designed to help shape a financially, socially and environmentally sustainable campus over the next decade.

This includes efforts to increase the amount of renewable energy used to light and heat university buildings by obtaining locally produced energy where applicable. There is also a new project utilising heat recovery methods to repurpose heat produced in Aalto research facilities to warm up other buildings.

Plans for further developing the outdoor areas on campus focus on increasing biodiversity, preserving the habitats that already exist and adding new species where applicable. For instance, the Amphitheatre landscaping project improved pathways and accessibility to outdoor spaces for students and staff, and introduced around 35 new pollinator-friendly species of plant.

In addition to the more long-term projects carried out according to the university's strategic goals, there are plenty of activities which involve students and other stakeholders, such as last year's Bioblitz citizens' science event, which identified over 300 different species on the Aalto University campus, including plants, insects, birds and fungi.

A total of 74 geothermal wells have been dug close to metro tunnels around the Aalto University School of Business building, the first large geo-energy solution in an urban area in the country, developed together with the Geological Survey of Finland. The building block is 90 percent self-sufficient in heating and cooling, and 156 solar panels have been installed on the roof to produce electricity.

Not only does the university focus on finding renewable energy solutions, it also seeks to reduce the overall amount of energy consumed. For instance, the campus energy saving campaign 2022-2023 resulted in a 14 percent decrease in energy consumption, a joint effort by the entire Aalto community.

Aalto University benefits from close collaboration between the various schools, combining expertise across multiple disciplines to find creative solutions. This has helped to create a campus which prioritises the wellbeing of the environment, students, staff, and the whole community.

Satu Kankaala is Head of Business Development and Sustainability at Aalto University Campus & Real Estate
https://www.aalto.fi/en/school-of-business

THE SCIENCE BEHIND BIOPHILIC DESIGN

Biophilic School Design – Great for Students, Teachers, and the Planet They Live On

"When biophilic design principles are applied at places where people are learning and teaching, good things happen – moods and cognitive performance improve (for students and teachers!) – which is always a plus, whether trigonometry or Latin grammar or colour theory feature in the lesson plan for the day."

Dr Sally Augustin, Science Editor

When schools are biophilically designed they feature:

- *Loads of natural light but mechanisms to eliminate glare.* Natural light is great for elevating our mental performance, whether you're trying to think creatively or not, but glare causes stress and stress keeps us from performing to our full potential. Adding blinds can eliminate glare (but ones that return to the up position automatically are best because once people pull down blinds they often don't return them to their original position) and so can setting up desks, screens, etc. at an angle from windows. Clerestory windows, which are smaller and placed on walls above adult standing eye level, can help keep glare down while admitting natural light, but they can't let in views. If people will be in school at night, circadian lighting is a big plus for a space.

- ***Views.*** It's great when schools can be located with views of nature outside; views of at least 50 feet through available windows are crucial (no matter what those views are of, less viewing distance is stressful). Seeing nature, particularly diverse, native plantings, is good for both our mental performance and also our stress levels (which can help us pay attention to whatever we're being taught, for example). So is seeing the sky. When views of nature outside (ideally scenes reminiscent of meadows with trees and a brook) aren't possible, art that depicts the same sorts of scenes that are so desirable when seen outdoors are a real plus. Even screen savers on monitors can support biophilic design if they feature these sorts of welcoming nature scenes. Youngsters and oldsters and in-the-middlesters with ADHD get an especially large mental performance boost from having views of nature.

- ***Moderate levels of visual inputs.*** When schools have too much going on visually learning performance falls and students can be distracted. This all relates back to our early days as a species when we needed to be able to see danger nearby; when we couldn't we are stressed. Being stressed diverts some of our mental processing power from the task at hand, whatever that might be. Being in a place that's too stark is also stressful. What's best? Aim for a moderate level of visual stimulation, about the same number of colours, shapes, and patterns you'd find in a residential interior designed by Frank Lloyd Wright, all arranged with the same level of order or sort of apparent plan as you'd find in that FLW house.

- ***Green leafy plants.*** Seeing green leafy plants has been tied to better cognitive performance (even creativity) as well as helping to eliminate mental refreshment, after people have gotten mentally exhausted, whether by learning or by teaching. One of two plants in view is best, more elevates visual clutter. Have lots of allergic kids in class? Artificial plants are as effective at improving what goes on in our heads as real, natural plants – as long as they're such "good fakes" that you need to touch them to determine if they're real or plastic.

- ***Natural materials.*** Studies have directly tied improved learning performance to being around natural materials, such as stone and wood with visible grain (ideally with a warm finish). Ideally, the wood should not cover more than about 50% of the surface area in a room.

- ***"Safe" seats with a view.*** We are most comfortable when we sit in a seat that gives us a good view of the area around us as well as the door to the room that we're in and we feel secure in that seat, for example that nothing might sneak up on us from behind (say another second grader). This is known in the psych biz as being in a space with prospect and refuge and is an important tenet of biophilic design. When as many people in a classroom or library or other learning space as possible have prospect and refuge, life for all is better. We feel protected from the rear when we back up to a wall, full height or shorter, or a tall plant or a large sturdy piece of furniture, for example. Research has shown that university/older students prefer to study in places with prospect and refuge. Not all seats in any space can allow prospect and refuge but the more the better, and circulation routes right behind student chairs need to be kept to the absolute minimum.

- ***Curving lines and straight lines thoughtfully deployed.*** We learn better when curving lines (in 2-dimensions in patterns on fabrics, for example, and in 3-diemnsions in shapes of the backs of chairs) are more plentiful than straight ones, but we move along more quickly and act more efficiently when straight lines are more plentiful than curving ones (which can be good to know if you're designing a hallway that lots of students will need to travel between class sessions).

- ***Nature sounds.*** When we hear nature soundscapes (the sounds for example, of birds peacefully singing, or gently flowing water, or quietly rustling leaves and grasses) we relax, refresh, and effectively process the information flowing into our brains.

- ***Water.*** Seeing water (with or without fish) is just as mentally refreshing and stress reducing as hearing it. A human-sized man-made fountain in a courtyard without plants or other natural elements in it can be just as refreshing to view as a Spring meadow with a few trees.

- ***Windows that open.*** When windows open people can take control of their environments and add (hopefully!) fresh air to a space, resulting in levels of carbon dioxide, etc., that are low enough to have insignificant effects on learning outcomes.

- ***Access to the outdoors.*** Outdoor spaces that are accessible promote learning among students of all ages, helping with managing energy levels, for instance, and reducing stress levels.

- ***Include multiple biophilic elements.*** With biophilic design, the effects of one biophilic element are definitely enhanced by the addition of another and another!

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For more information on biophilic school design, take a look at:

Lindsay Baker and Harvey Bernstein. 2012. "The Impact of School Buildings on Student Health and Performance: A Call for Research," http://www.centerforgreenschools.org/sites/default/files/resource-files/...

Peter Barrett, Alberto Treves, Tigran Shmis, Diego Ambasz, and Maria Ustinova. 2019. "The Impact of School Infrastructure on Learning: A Synthesis of the Evidence." The World Bank, Washington, DC, https://www.researchgate.net/publication/329402892_The_Impact_of_School_...

Peter Barrett, Yufan Zhang, Fay Davies, and Lucinda Barrett. 2015. "Clever Classrooms: Summary Report of HEAD Project." University of Salford, https://docs.wixstatic.com/ugd/902e4a_6aa724a74ba04b46b716e528b92ad7fc.pdf

Matthew Browning and Alessandro Rigolon. 2019. "School Green Space and Its Impact on Academic Performance: A Systematic Literature Review." *International Journal of Environmental Research and Public Health, vol. 16*, no. 3, p. 429, https://doi.org/10.3390/ijerph16030429

Jim Determan, Mary Anne Akers, Tom Albright, Bill Browning, Catherine Martin-Dunlop, Paul Archibald, and Valerie Caruolo. 2019. "The Impact of Biophilic Learning Spaces on Student Success." https://www.terrapinbrightgreen.com/wp-content/uploads/2020/01/The-Impac...

Karrie Godwin, Audrey Leroux, Peter Scupelli, and Anna Fisher. 2022. "Classroom Design and Children's Attention Allocation: Beyond the Laboratory and Into the Classroom." *Mind, Brain, and Education, vol. 16*, no. 3, pp. 239-251, https://doi.org/10.1111/mbe.12319

Harvard T.H. Chan School of Public Health. 2017. "Schools for Health." https://schools.forhealth.org

Astrid Roetzel, M. DeKay, A. Kidd, A. Klas, A-M. Sadick, V. Whitterm, and L. Zinkiewicz. 2020. "Architectural, Indoor Environmental, Personal and Cultural Influences on Students' Selection of a Preferred Place to Study." *Architectural Science Review, vol. 63*, no. 3-4, pp. 275-291, https://doi.org/10.1080/00038628.2019.1691971

C. Tanner. 2008. "Explaining Relationships Among Student Outcomes and the School's Physical Environment". *Journal of Advanced Academics, vol. 19*, pp. 444-471.

C. Tanner and Jeffrey Lackney. 2006. *Educational Facilities Planning: Leadership, Architecture, and Management*. Pearson; New York.

Nicole van den Bogerd, S. Dijkstra, Sander Koole, Jacob Seidell, and Jolanda Maas. 2021. "Greening the Room: A Quasi-Experimental Study on the Presence of Potted Plants in Study Rooms on Mood, Cognitive Performance, and Perceived Environmental Quality Among University Students." *Journal of Environmental Psychology, vol. 73*, 101557, https://doi.org/10.1016/j.jenvp.2021.101557

Nicole van den Bogerd, S. Dijkstra, Karin Tanja-Dijkstra, Michiel de Boer, Jacob Seidell, Sander Koole, and Jolanda Maas. 2020. "Greening the Classroom: Three Field Experiments on the Effects of Indoor Nature on Students' Attention, Well-Being, and Perceived Environmental Quality." *Building and Environment, vol. 171*, 106675, https://doi.org/10.1016/j.buildenv.2020.106675

Rotraut Walden (editor). 2015. *Schools for the Future: Design Proposals from Architectural Psychology*. Springer Fachmedien, Wiessbaden, Germany.

MEETING DIFFERENT NEEDS IN AUTISTIC STUDENTS THROUGH NATURE

Dr Samantha Friedman

"Biophilic Design can help so many of us flourish. Here we learn how students with autism can really benefit from having a nature connection woven into the design of schools."

Autistic students often have negative school experiences, particularly in mainstream settings, for a variety of reasons; these include misunderstandings from peers and teachers, sensory environments which are painful or uncomfortable, and a lack of autonomy (Goodall, 2018; Horgan et al., 2022). Many educators have outdated understandings of autism and view it as a deficit in need of 'fixing' rather than taking a neurodiversity paradigm approach. The neurodiversity paradigm sees autism as one of many valid and natural ways of functioning which comes with its own range of benefits and challenges (den Houting, 2019). In addition to addressing the harmful and pathologising way of thinking about autism which often dominates in classrooms, educators should also be seeking out ways they can change the physical environment within which their students, including their autistic students, are educated. Considering elements of biophilic design which integrate nature in the classroom could be one such option; additionally, seeking out opportunities for students to actively experience nature on their own terms might also help to disrupt these typically negative school experiences.

My co-authors and I recently undertook a survey study of 127 autistic adults in the UK to understand how these participants experienced nature and how nature might support their wellbeing. We published these findings across two papers, one which presented those findings specific to the Covid-19 pandemic (Friedman et al., 2023a) and the other which pertained to the broader life course (Friedman et al., 2023b). In both of those contexts, the findings we developed suggested that autistic adults use (or have used) nature to support their wellbeing by meeting needs related to both escape and connection.

Participants shared that they used nature to escape from unwelcoming or unkind people, inhospitable or uncomfortable situations, and stressors and pressures of daily life. Conversely, participants (sometimes the same people who used nature to escape as well) also used nature as a space in which to connect with themselves and others (including family and peers) and as something with which to form a close relationship. For our participants, it seemed important throughout the life course that they had the autonomy to choose how they experienced or used nature; in situations where they were forced to engage with nature or when nature was coupled with unpleasant people or experiences, there was no benefit to their wellbeing. Thus, it seems that nature itself does not universally promote wellbeing for all autistic people in all contexts; instead, it might meet a range of needs for some autistic people but there is variation even within a single individual as to how well and when it might do this.

By considering the findings from our recent publications, and from other research and the wealth of lived experiences shared by autistic people (e.g., McAnulty, 2020), we can use this increased understanding of autistic people's experiences in nature to inform changes and choices around making spaces more inclusive and welcoming for autistic people. This could be particularly important in places like schools where autistic students have to confront distressing sensory and social experiences. Through integrating both biophilic design and more opportunities for children to autonomously engage with nature, educators can take important strides towards making schools kinder places for autistic students. What follows are several suggestions for how this could be done.

First, using biophilic design and integration of nature-based audio/visual stimuli, nature can be made more accessible for those autistic children who might not want to engage with nature outdoors for a range of reasons. Allowing autistic people to interact with nature on their own terms (or not at all), including those interactions which might take place indoors, is one way of respecting their autonomy. The integration of nature-based elements into indoor spaces might provide autistic students the opportunity to begin developing or deepening a connection to nature for those who might previously have had negative experiences outdoors, who might not enjoy some of the sensory experiences of being outdoors, or who might be physically unable to access some outdoor spaces. These subtler exposures to nature might also offer some of the physiological benefits associated with viewing natural stimuli, like increased relaxation (Jo et al., 2019), although how these benefits are experienced by autistic young people within a high-stress, high-stimuli environment like a school remains to be studied.

Second, design choices could consider the ways in which autistic children might want to use nature as a source of connection and/or escape. In outdoor play spaces, integrating both communal and independent spaces and opportunities to seek out and reduce sensory stimuli could be ways of meeting the heterogeneous needs of autistic students. Outdoor spaces might also offer spots to hide away, play collaboratively, play imaginatively, or simply be. Importantly, these design choices should be made by and with autistic people.

Finally, many autistic people have passions or focused interests in nature or nature-adjacent topics (Grove et al., 2018). Incorporating nature into design and curricular choices can be one way of embracing and supporting these interests (though these interests should be incorporated into education regardless of if they are nature-based or not). Showing genuine interest in and harnessing the passions of autistic students is one important way of validating neurodivergent identities. Where those interests are related to nature, autistic students could be given the opportunity to decide how to bring natural stimuli into the classroom to promote relaxation for all students, for instance.

There are many ways in which the education system could improve to better support autistic children and provide more affirming educational experiences. Given the burgeoning research on autistic people's experiences and interests in nature and the wealth of anecdotal accounts which exist, it seems clear that incorporating nature into design, both in indoor and outdoor educational settings, and curriculum could be an important step forward.

https://www.northumbria.ac.uk/about-us/our-staff/f/samantha-friedman/

Look for the podcast that accompanies this article on the podcast page on The Journal of Biophilic Design website, and also on our RSS feeds on Spotify, Audible, iTunes and all the other podcast platforms.

References

den Houting, J. (2019). Neurodiversity: An insider's perspective. *Autism, 23*(2), 271–273. https://doi.org/10.1177/1362361318820762

Friedman, S., Noble, R., Archer, S., Gibson, J., & Hughes, C. (2023a). Respite and connection: Autistic adults' reflections upon nature and well-being during the Covid-19 pandemic. *Autism*. https://doi.org/10.1177/13623613231166462

Friedman, S., Noble, R., Archer S., Gibson, J., & Hughes, C. (2023b). 'It helps make the fuzzy go away': Autistic adults' perspectives on nature's relationship with well-being through the life course. *Autism in Adulthood*. In press.

Goodall, C. (2018). 'I felt closed in and like I couldn't breathe': A qualitative study exploring the mainstream educational experiences of autistic young people. *Autism & Developmental Language Impairments, 3*. https://doi.org/10.1177/2396941518804407

Grove, R., Hoekstra, R. A., Wierda, M., & Begeer, S. (2018). Special interests and subjective wellbeing in autistic adults. *Autism Research, 11*(5), 766–775. https://doi.org/10.1002/aur.1931

Horgan, F., Kenny, N., & Flynn, P. (2023). A systematic review of the experiences of autistic young people enrolled in mainstream second-level (post-primary) schools. *Autism, 27*(2), 526–538. https://doi.org/10.1177/13623613221105089

Jo, H., Song, C., & Miyazaki, Y. (2019). Physiological benefits of viewing nature: A systematic review of indoor experiments. *International Journal of Environmental Research and Public Health, 16*(23), 4739. https://doi.org/10.3390/ijerph16234739

McAnulty, D. (2020). *Diary of a young naturalist*. Little Toller Books.

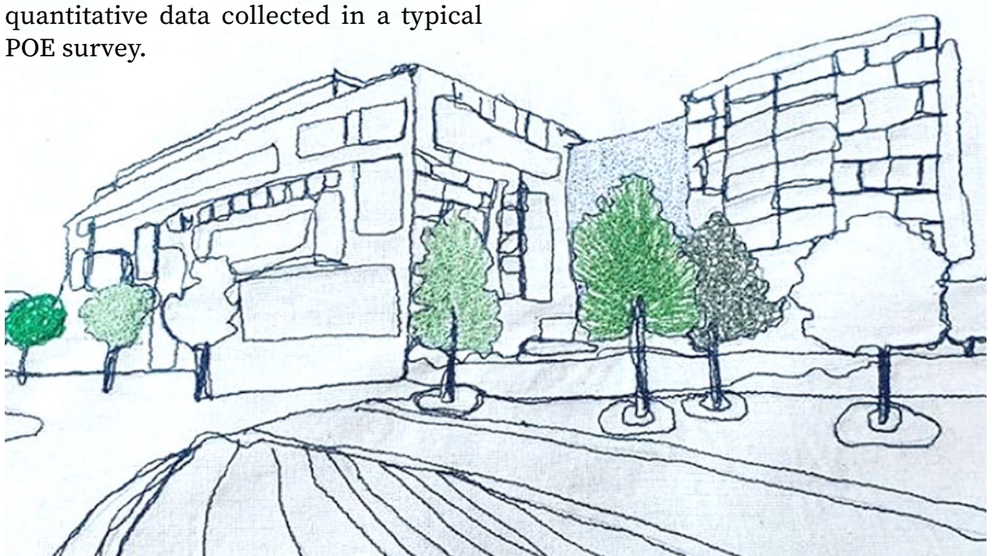
'Alone-together'

"What does it mean to design for privacy and connection at the same time?"

Dr Harriet Shortt

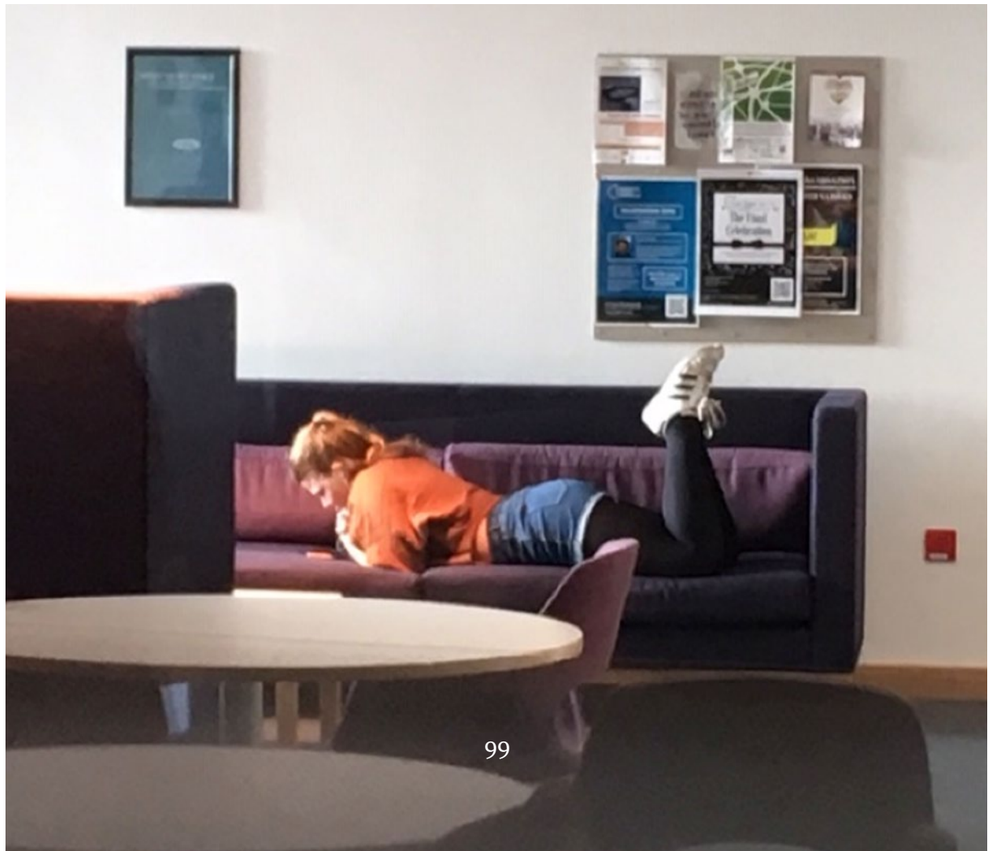
University buildings: how are they used and how do people feel about them? These are the questions we asked staff, students, and visitors as part of our research on the Bristol Business School building at the University of the West of England. Funded by the architects of the building, Stride Treglown, and construction company, ISG, our research was a POE (post-occupancy evaluation) with a difference. We asked all users of the building to take photographs of how they were using the building and how they felt about the building. This visual method, called 'participant-led photography' (see Shortt and Warren 2012, 2019 for examples) is a collaborative, participatory method that allows the voices and stories of participants to be heard and seen. The aim of this approach was to generate a large visual data set that captured the emotional, sensory, and lived experience of the building for users, which would complement the more quantitative data collected in a typical POE survey.

One of the key themes to emerge from this research was 'visibility and transparency'. Our participants shared images about how they felt 'exposed' or 'on show' in various spaces across the building, largely because there is a great deal of glass used in its design. The ethos of the building included a sense of transparency to encourage collaboration, the collision of ideas between groups, and to showcase users work. Yet, it seems, according to our data, this idea of transparency is understood and experienced differently. Many users felt this 'constant exposure' had a detrimental impact on their sense of well-being and their ability to do their work. These experiences echo Gabriel's (2005) reflections on glass cages and glass palaces – where buildings such as these are so representative of present-day workplaces. As Gabriel notes, the modern employee is part of a cast exposed to the critical gaze of the consumer – we are part of the 'brand on show', where our teaching and learning practices (both from staff and students' perspectives) are on show for all to see.



We also know that the lack of control over our physical environment plays a role in the discontent and discomfort we can feel in the workplace (see Baldry, 1999; Knight, 2010; Dale and Burrell, 2008). The wider design narrative here is that openness and glass facades and huge atria speak of collaboration and togetherness, but we have seen that this can create feelings of exposure and insecurity. So, what is the response to this unforgiving gaze and continuous exposure? What do people do in response to these open spaces? What happens when you put a large group of people in a building made mainly of glass? Interestingly, in our data, we see subtle forms of resistance – people start to make 'dens'.

In our visual data set, and the narratives that went with them, we see pictures of how people organically manage their lack of privacy, and, as Gabriel notes, these are nuanced acts of defiance, creating spaces that are somehow sheltered from continuous exposure. For example, members of staff create makeshift 'blinds' using flip chart paper blu-tac'd to internal glass windows to create privacy in a glass classroom. A member of staff told us,"*The other day, I arrived at my office, turned my key into the lock, opened the door, switched the light on, and put my coat on the hanger. I heard some noises coming from behind the block of cabinets and went to see what it was. My eyes met the eyes of my colleague, and we laughed! I knew exactly what he was doing there! Hiding behind the cabinet! You just can't have a minute of peace in this office without a student coming to ask you whether you have seen someone, whether someone still works here, or whether you have a bloody stapler*".



Indeed, the narratives from staff raised questions and reflections about the multi-faceted nature of academic work, where 'work' includes a portfolio of teaching, research, writing, administration, mentoring, collaboration and so on – but each of these activities requires different kinds of space to perform it creatively and effectively. However, the transparent academic walls invite unscheduled chats, causing interruptions at times when deep concentration is needed – it seems that being 'visible' is interpreted as 'being available'. One participant candidly said, '*I'm really student focussed, I love students being around the building, but how do I also say, f**k off I'm eating my sandwich?*'

It is not just staff that feel this sense of exposure and 'gaze', students too talked about creating 'cosy', 'hidden away' spaces in the building. They took pictures of and talked about moving the furniture, taking their shoes off, moving cushions on sofas, and curling up to read or watch TV on their laptops. They told us they use the corners and chairs to 'hide away from the world', that they like the 'low level lighting' and feel like they are in a 'cave'. It was noticeable in the photographs that students took many of the spaces or 'caves' they created are in the booths, and despite being made for four to six people, many chose single occupancy and used their belongings to fill the space, creating little barriers to entry. Students said, for example,' *We love the booths, like your own little cocoon in the building! It's so cosy here*.' and '*It reminds me of my mum's kitchen* (referring to a communal kitchen and sofa space) – *I can be alone here to work, in my own space, but be close to the lecturers*.' These data speak to the fact that people prefer, at times, the enclosed, semi-private spaces they can make their own.

It is not just the space that is important in this Higher Education building, but the practices that are going on within them – this sense of finding security, a sense of ownership, freedom from the organisational gaze, and somehow creating a cosy, cave-like place. What the students really love are the sheltered booth seats and break-out spaces scattered across the building. Indeed, across the 750+ photographs captured by the 250+ people that took part in this research, there was a marked absence of classrooms and formal teaching and learning spaces.

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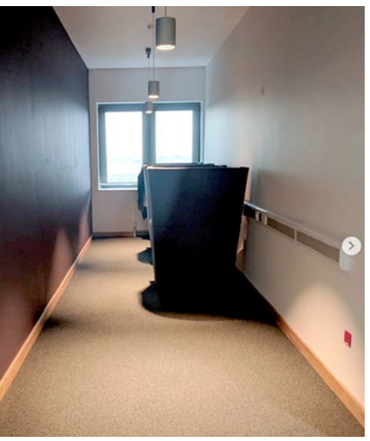
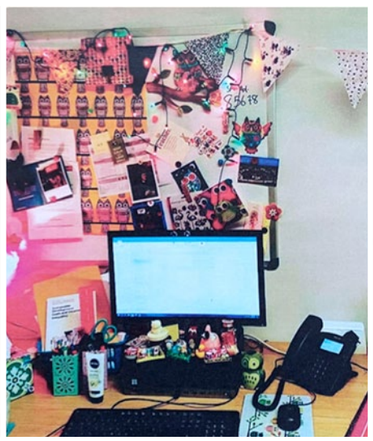
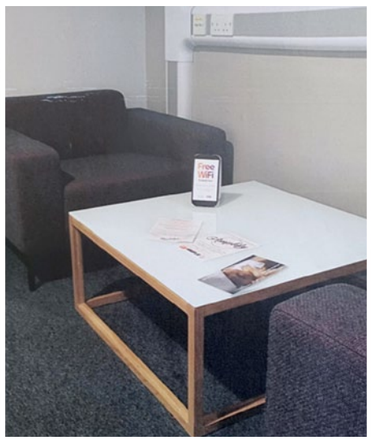
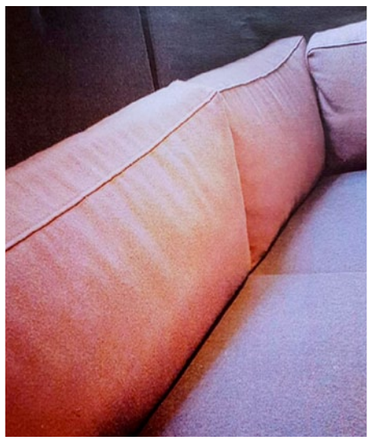
In exploring these nooks and cave like spaces, the work of David Sobel on why children make dens (2002) has proved to be a useful framework for exploring this user behaviour. In his work, Sobel examines children's dens as secret hiding places – these are 'just for me' spaces where we cannot be seen. Children gravitate towards creating these spaces because they are detached from ongoing intimate relations with adults, siblings, teachers, and peers. It is in these spaces that they can control their own environment and enjoy freedom from the rules of the adult world. In addition, in these moments – often at home or at school – children have the experience of being simultaneously immersed in AND separate from their environment, and it is this that is most relevant here; *being simultaneously immersed in AND separate from your environment*. So, we might ask- do we ever lose a sense den-making in adulthood? And is den-making part of contemporary workplace spatial practice?

We can certainly see parallels with Sobel's work on children's den-making and our POE data. Sobel notes 3 ways in which dens can be defined:

- **Secrecy** – according to Sobel, key to a den is a sense of secrecy. He argues this creates a sense of 'satisfying isolation', and not being seen once inside or being largely out of sight is very important to the occupier of the den. We have seen this occur in our data – the turning of the furniture, the hiding behind a cabinet, the concealed, private nature of these spaces and how they are made, the flip chart paper on the windows. Students talk of hiding away from the world, spaces slightly cut off from other areas. Clearly the sense of isolation and largely, it seems, being alone and undisturbed, is a key feature of why these spaces are important to users.

- **Place-making/place-shaping** – Sobel argues that children are literally making a place for themselves in the world (the tree house, the tablecloth tent, the bush cave) and these are invented by themselves, creating spaces for storage or personal objects – old rocks, special shells, a blanket – they are making small worlds. In our data we see and hear people feeling cosy, creating 'a place of my own' a place to personalise and take snacks.


- **Security** – for children, says Sobel, dens have a feeling of calm, there is often a reflective or quiet aspect to being in these places and a safeness that they can return to – a sort of retreat, even when dens end up being close to home, in rather innocuous places, or in very public locations. We hear and see in our data how people enjoy these spaces as they describe them as 'cocoons', 'caves' and 'places to curl up and nap', or 'my mum's kitchen', or 'our own little living room' – there is a real sense of shelter, refuge or 'just like home'.

It seems a den is in the eye of the child/ the creator – if it meets these three needs, it is a den. All this is a response to continuous exposure and the ongoing intimate relations that the organisation insists on encouraging though their narratives of collaboration and blurring of boundaries. Here, in our data perhaps resistance is subtle, like Sobel's children resisting the rules of the adult world. People are being simultaneously immersed in the workplace AND wanting/ needing to be separate from it, by curating places for security and secrecy. There is also a sense of autonomy here – the choiceful act of finding and curating a place to be simultaneously immersed in AND separate from your environment. It is these data that speak of the need to be 'alone-together'. We want to find places for 'satisfying isola*tion*', but not feel isola*ted*. We want to be alone, private, create a space that is just ours, but still feel like we are connected to those around us. We seek comfort in being alone, but not lonely, and not disconnected. We want to be connected, but private. We want to feel that sense of belonging to a community without having to be forced *into* it.

As a result of all this we can say that the design of this building has achieved its aim of visibility and transparency, but how this is experienced is complex and nuanced. There are clear tensions between visibly sharing and displaying what we do in our educational establishments, and how this makes people feel. We might question then: is there more to the dichotomy between transparency versus privacy at work? How is privacy made, lived, and experienced? How do we respond to transparency? And how do we cope with constant exposure? And is this need or wish to be 'alone-together' about 21st Century living in *general*? Might this relate to how we cope with being forced to interact so much of the time? Perhaps a new term of spatially embedded community is required here. We need to re-think how we claim physical and psychological space and privacy, where we can 'hide' but still feel part of our communities – this evolving human need to be 'alone-together'.

References

Baldry C (1999) Space – the final frontier. Sociology 33(3): 535-553.

Dale K and Burrell G (2008) The Spaces of Organization and the Organization of Space: Power, Identity and Materiality at Work. London: Palgrave.

Gabriel, Y. (2005) Glass Cages and Glass Palaces: Images of Organization in Image-Conscious Times. Organization 12(1):9-27

Knight, C and Haslam, S. (2010) The Relative Merits of Lean, Enriched, and Empowered Offices: An Experimental Examination of the Impact of Workspace Management Strategies on Well-Being and Productivity. Journal of Experimental Psychology Applied 16(2):158-72

Shortt, H., & Warren, S. (2012). Fringe benefits: Valuing the visual in narratives of hairdressers' identities at work. Visual Studies, 27(1), 18-34.

Shortt, H and Warren, S. (2019) Grounded Visual Pattern Analysis: Photographs in Organizational Field Studies. Organizational Research Methods, 22 (2) 539-563.

Sobel, D. (2002) Children's Special Places: Exploring the Role of Forts, Dens, and Bush Houses in Middle Childhood. Wayne State University Press

To download the full report from this project visit www.myuwebbsview.com

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PLANTS

Greening Education: Boosting Learning, Health, and Sustainability in Schools with Living Walls

"Investing in education fosters the development of human capital. Allocating budgets to fund the integration of biophilic design into educational institutions has demonstrated a proven return on investment. This is because students, teachers, and communities as a whole benefit from biophilic design exposure and the educational experiences certain elements of biophilic design can offer."

Lily Turner with **Sarah Janjua**

Current studies show that classrooms designed with direct or indirect connections to nature can support mental well-being, increase learning rates, and improve test scores. This all leads to increased graduation rates, which has a direct positive financial translation on communities.

There are a variety of ways to incorporate biophilic design into educational institutions. Approaches range from allowing students to orient their desks to face the window during independent activities (such as studying or testing), using floor tiles with biomorphic patterns, allowing teachers to minimize educational materials on the walls, to bringing live plants into the classroom. While the first three approaches may foster some benefits of biophilic design, integrating living plants in educational institutions provides numerous more benefits. Specifically, Living Walls as a form of biophilic design in educational settings boost learning, support physical and mental health, and promote sustainability – making them an optimal choice for educational institutions.

Boosting Learning
Living Walls in schools offer valuable educational opportunities. Teachers can use them to teach students about biology, ecology, and environmental sustainability. Students can also participate in the care and maintenance of the Living Wall, promoting a sense of responsibility and environmental stewardship through hands-on learning experiences.

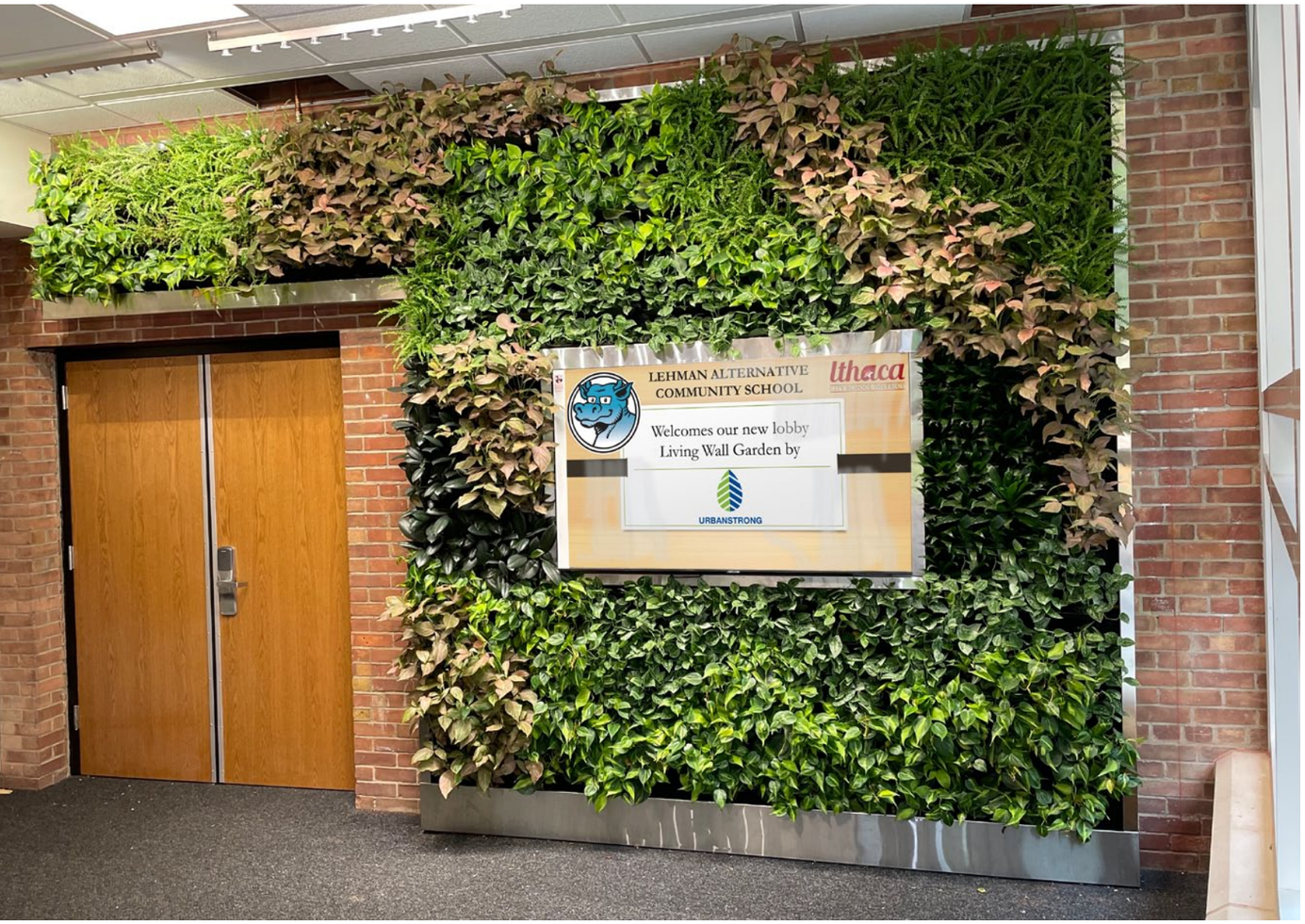
Supporting Health
Living Walls nurture physical and mental well-being. Visual access to greenery has been proven to improve both recovery from scholastic stresses and satisfaction of educational environments. The presence of living greenery has a calming effect on individuals – reducing stress, anxiety, and even symptoms of depression. Living Plant Walls also serve as sound barriers, reducing ambient noise in indoor spaces which is beneficial for mental well-being. Finally, Living Walls act as natural air purifiers through absorbing pollutants and releasing oxygen. Cleaner air can lead to improved cognitive function, better decision-making, and a sense of well-being.

Promoting sustainability
Installing Living Walls demonstrates a commitment to sustainability and environmental responsibility. From an educational perspective, it encourages students to think about their ecological footprint and the importance of incorporating green solutions into their daily lives. And from an operational perspective, Living Walls can help improve energy efficiency by acting as natural insulation for temperature regulation which can lead to decreased energy consumption.

Living Walls in educational settings offer a diverse array of advantages to all occupants. They establish an environment conducive to the holistic well-being of both students and faculty, fostering a culture of support that extends its benefits to broader communities. Embracing these green installations transcends aesthetics, nurturing the intellectual and emotional growth of individuals, promising a brighter future for all.

CASE STUDY

Project: Lehman Alternative Community School Living Wall
Project Location: Ithaca, New York, United States
Size: 100 square feet / 9.29 square meter
Irrigation: Non-recirculating, direct to drain connection
Plant Species: 6 different species
Total Number of Plants: 510



100 square foot hydroponic Living Wall in the lobby of Lehman Alternative Community School in Ithaca, New York, installed by Urbanstrong in 2023

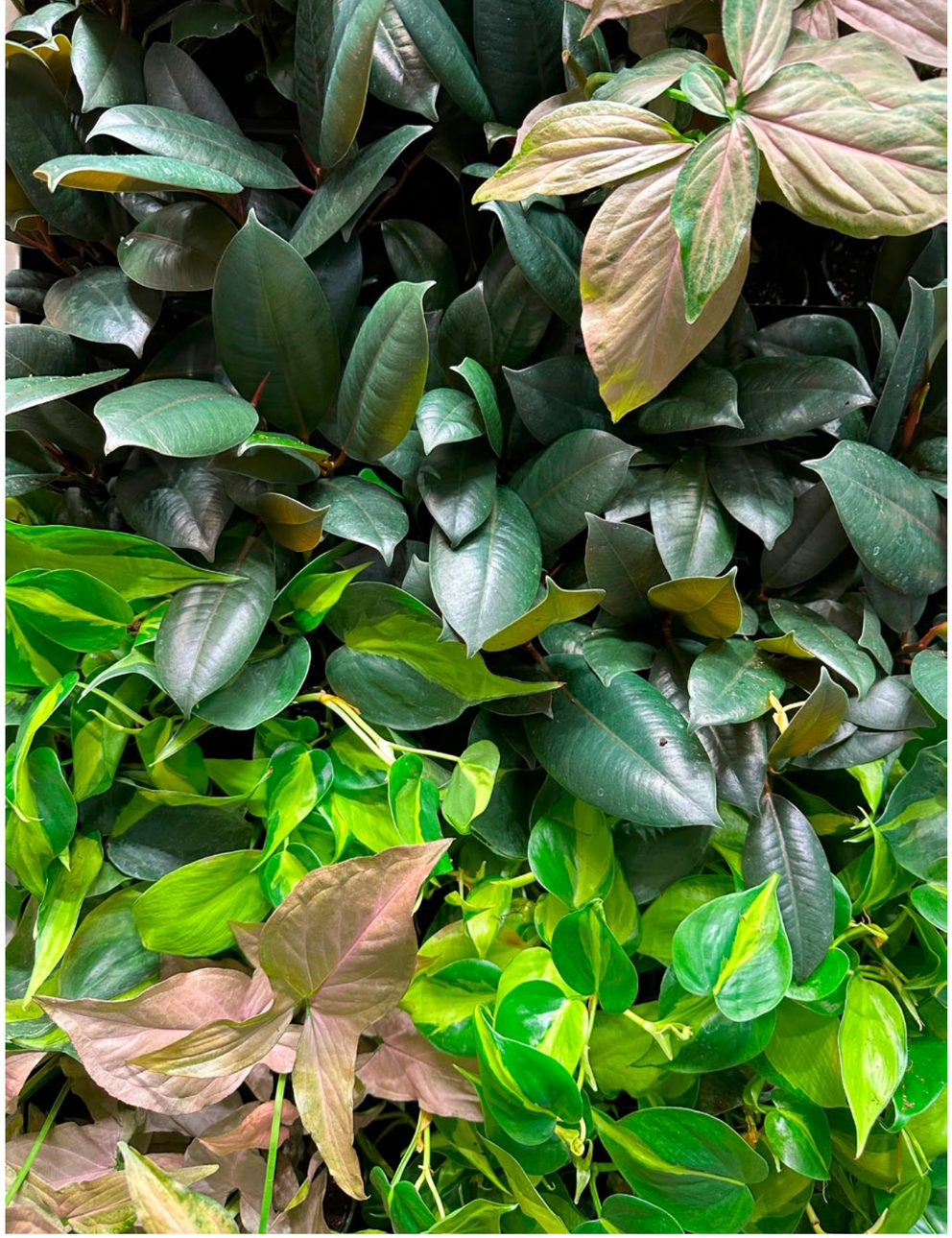
Lehman Alternative Community School (LACS) is a nationally renowned public, alternative, combined middle and high school serving grades 6–12 with just over 300 students. The school values learning outside of the classroom, and classes are small and explore subjects in-depth with an emphasis on student engagement. In 2021, the school turned to its students for input when contemplating cosmetic enhancements to the campus. The decision came down to either upgrading outdoor recreational lighting or introducing a captivating green wall at the school's entrance. The students, displaying enthusiasm, wholeheartedly championed the concept of a Living Wall and soon after, actively engaged in the design process. Their commitment went above and beyond as they even embarked on a visit to the architect's office, presenting a compelling case for the green wall and advocating for the allocation of reserved funds toward this pivotal aspect of the project.

Close-up shot of the irrigation line, highlighting how each individual plant receives its own water

Urbanstrong (a Brooklyn, New York based full-service green building firm on a mission to integrate nature back into the built environment) was subcontracted to design and install the Living Wall. The Urbanstrong team consulted with the architect on all living wall systems available on the market, and upon factoring in parameters such as design goals and available infrastructure, ultimately landed on a living wall solution that met design and maintenance goals.

The Living Wall system installed in LACS is the industry's premier interior system in terms of designability, installation ease, and maintenance. The system features a patented modular tray system that can be made in different lengths, which allowed the system to be configured to the requested shape and size (specifically, accommodating the television and Living Wall extension above the doorway). In regards to the irrigation system, it is designed to be water efficient – each individual 4" plant receives its own water and the system does not require constant watering, which is beneficial for plant health and sustainability.

Planting process of the 100 square foot hydroponic Living Wall



The plant palette for this Living Wall was chosen to appeal to a broad range of senses including color, depth, and texture

The installation of the Living Wall in the LACS school lobby has transformed not only the physical space but also the atmosphere and the experiences of everyone who walks through the school doors. All of the stakeholders involved are thrilled with the results. The receptionists deeply appreciate the view of the Living Wall, and the staff is eager to incorporate it into the curriculum at LACS. From improving air quality and reducing stress to inspiring curiosity and learning, the living wall will become an integral part of the LACS educational environment.

https://urbanstrong.com/

plants@work

Plants ~ our Perfect Partners

"Plants have long been recognised as not only reducing our stress levels but also cleaning the air around us."

Coll Smith

How plants improve our lives

Of course, reducing our stress levels and cleaning the air are favourable attributes but when we look at both of these more closely we see these are essential solutions to our comfort and health.

Plants cleaning the air we breathe

The original research carried out in the USA was to keep the air inside of space ship clean; very different circumstances to our homes and offices where conditions constantly change.

According to Kenneth Freeman of Purposeful Places and current chair of plants@work "*The key is to match the plants well to their environment. The more closely matched they are, the more physiologically active they will be, and that is when the effects will be greatest.*"

He goes on to explain that VOCs (Volatile Organic Compounds) found in almost anything you can smell e.g. paints, new furnishings, cleaning products, cosmetics, toiletries and more will cause most of the problems in the air.

While most homes are unable to house enough plants to purify the air, there are some ways plants can be used. Offices have more opportunities to install more plants but then there are more people to 'contaminate' the air.

Whilst most plants can clean the air to some extent, some good plants for cleaning the air in office/work circumstances include Philodendron, Aglaonema, Calathea, Ctenanthe, Dracaena, Ficus and some ferns as well as the ever popular Spathiphyllum.

Plants reducing our stress levels

Plants have performed well in reducing our stress levels too. In Australia research showed that even one plant showed a reduction of stress levels by as much as 50% when placed nearby. Using psychological survey questionnaires, Margaret Burchett showed a mean average of reductions in negative mood states of between 40-60%.

Specific reductions:
- Depression - 58%
- Overall stress - 50%
- Anxiety - 37%
- Fatigue - 38%
- Confusion - 30%
- Overall negativity - 65%
- Anger - 44%

In the control group with no plants, stress levels rose by 20%

Plants calm us

In research carried out in Edinburgh, project leader, Jenny Roe, a lecturer at Heriot-Watt's School of the Built Environment confirmed that the findings were strong and indicate that plants have a calming effect on our brains.

In the experiment, twelve healthy, young subjects wore portable EEG machines attached to their heads and under their hats. These recorded their brain wave patterns on the laptops in their backpacks. They were sent on a walk of about 1.5 miles around different parts of Edinburgh.

"*Natural environments still engage the brain, but the attention demanded is effortless. It's called involuntary attention in psychology. It holds our attention while at the same time allowing scope for reflection and provides a palliative to the nonstop attentional demands of typical, city streets.*

This research confirms that plants help to keep us calm or provide a calm environment for us which is why it is so important to have plants in the workplace. A busy day at work perhaps surrounded by the noise of people and/or machines, the pressures of deadlines and more means that we need some space to 'provide a palliative to the nonstop 'attentional demands' of the working day. Adding plants to the workplace and in break-out areas is a way to facilitate this."

Information from www.plantsatwork.org.uk and
a plants@work publication *Plants Our Perfect Partners* 2022

Photos credit: Flower Council of Holland

ENVIRONMENT
PEOPLE
PLANET

FORTY-ONE PERCENT OF AMPHIBIAN SPECIES ON THE BRINK OF EXTINCTION

"Amphibians, the diverse and fascinating creatures that bridge the gap between aquatic and terrestrial ecosystems, face an alarming crisis. According to a recent study, 41 percent of amphibian species are now threatened with extinction."

Alexander Verbeek

I find these numbers stunning and wonder why this isn't on the front pages of the world's newspapers. These ominous data should wake policymakers up to the urgent need for global conservation efforts to protect these vital and often overlooked members of our planet's biodiversity. The Second Global Amphibian Assessment was published in Nature, which evaluated 8,011 species for the International Union for Conservation of Nature Red List of Threatened Species.

Silent Decline

Amphibians have long been recognized as environmental indicators due to their sensitivity to changes in habitat quality and water pollution. In the Netherlands, we see the near extinction of the "geelbuikvuurpad" (*Bombina variegata*); my country still has just about 250. Amphibians serve as a barometer for the health of our ecosystems. But, the recent assessment reveals that this barometer shows a grim forecast.

It makes me sad to report about their decline. Since I was a child, I have always liked frogs, in their wild variety in sizes, shapes, and colours, and above all, their facial expressions. Choosing out of all animal species in the world a frog as the face of the animals of Sesame Street shows that I must not be alone in my sympathy for these Kermit-like animals.

But many frogs are among the 41 percent of species now at risk, together with toads and salamanders – the charismatic icons of amphibian diversity. These creatures are crucial in controlling insect populations, serving as prey for larger animals, and contributing to ecosystem nutrient cycling. Their decline could set off a chain reaction with far-reaching consequences.

Habitat Loss and Climate Change

Habitat loss remains a primary driver behind the decline of amphibian populations. As human activities continue infringing upon natural habitats, these animals have fewer places to live. Wetlands are essential for amphibians, providing breeding grounds and shelter. The destruction of wetlands exacerbates their vulnerability.

Just look at the climate change-related disasters you see in the news through the eyes of a frog, and you can see how the climate crisis compounds the challenges amphibians face. Rising temperatures can disrupt breeding patterns, alter migration routes, and impact the availability of crucial resources.

Amphibians, with their sensitive skin and physiological dependencies on temperature and moisture, are especially vulnerable to these changes. Add to this the impact of wildfires, sea-level rise, or drought, and you get a grim picture of the many challenges amphibians have to deal with on an increasingly hostile planet.

The Chytrid Fungus

One of the most significant threats to amphibians is the chytrid fungus Batrachochytrium dendrobatidis (Bd). This pathogen has caused devastating declines and extinctions in amphibian populations worldwide. Bd infects the skin of amphibians, interfering with their ability to respire and leading to death.

Efforts are underway to combat the chytrid fungus, including developing antifungal treatments for affected populations and conducting surveys to identify disease hotspots. However, the battle against this deadly pathogen is ongoing.

Global Conservation Efforts

Conservationists and researchers worldwide are rallying to save amphibians from the brink of extinction. Initiatives are being undertaken to protect and restore their habitats, create captive breeding programs for endangered species, and raise awareness about the importance of amphibians in ecosystems.

Efforts to reduce pollution, conserve wetlands, and mitigate climate change also play a vital role in securing the future of amphibians. International collaboration is essential, as amphibians know no borders, and their conservation requires a coordinated, global response.

The planet's biodiversity crisis

The plight of amphibians serves as a stark reminder of the broader biodiversity crisis our planet faces and a warning sign of environmental degradation that affects us all. The fate of the threatened species is inextricably linked to our ability to preserve the delicate balance of nature and, in doing so, safeguard our own future.

https://substack.com/@theplanet

Workspace Design Show announces first names for speaker programme at its 2024 London show

November 2023, London: Following on from successful shows in both the UK and the Netherlands this year, Workspace Design Show is pleased to announce the first names to be added to the speaker programme for its London 2024 show. Held from 27-28 February 2024 at the Business Design Centre, Islington, the event will feature an impressive mix of senior professionals from architects and designers to developers and end users, who will come together to discuss the most pressing issues facing the workplace design community now and into the future.

Confirmed speakers so far include Helen Berresford, Head of ID:SR, Sheppard Robson, Golnaz Ighany, Sustainability Director, BDP, Collin Burry, Design Principal, Gensler and Oliver Hall, Partner - Architecture and Sustainability at Make Architects. Representatives from occupiers include Louise Sheppard, UK Head of Workplace Services & Social Sustainability, Zurich and Sue Glew, Programme Director, The Better Workplace Programme, British Telecom, and Neil Usher, VP Places, Sage, with other highly-experienced industry professionals including Guzman de Yurza, Global Head of Workplace Strategy Capability, JLL and Sally Marshall, Director, Turner & Townsend.

The speaker programme will delve into the most urgent topics confronting the sector. These include The Holy Trinity of Culture, Space & Opportunity; Exploring the reality of neurodiversity, inclusivity and equality; AI or die? Using AI in workplace design to enhance creative output and generate innovative ideas; and Designing a workplace that meets cross generational needs.

Workspace Design Show 2024 will again feature four different talks programmes, featuring 120 speakers. The Workspace Design Talks will be exploring the latest trends and insights in workplace design, strategy and culture, while the Sustainability Works programme will also return for next year's edition. This stream of discussion will again bring together a selection of key figures behind the workplace market's leading sustainable initiatives, projects and product developments.

The FIS Conference, a not-for-profit representative body for the £10 billion finishes and interiors sector in the UK, will once again take place at Workspace Design Show, providing a platform for the latest industry thinking from the finishes and interiors sector.

The Occupiers Forum, meanwhile, will provide 'The View from HQ', giving that crucial perspective from the occupier side of the workplace design equation, as well as providing insights into what employers are doing to create an engaging workplace experience.

Once again, Workspace Design Show will gather together leading architects, designers, real estate professionals, tenants and other industry experts to exchange their insights around the world of workplace design.

Workspace Design Show 2024,
27-28 February 2024,
Business Design Centre,
52 Upper St, London N1 0QH

workspaceshow.co.uk

CAT Thermometer

The temperatures on the CAT thermometer are 'median' warming estimates in 2100. This means that there is a 50% chance that the calculated temperature would be exceeded if the given emissions pathway is followed.

For example, there is a 50% chance that warming associated with our pledges and targets scenario exceeds 2.0°C in 2100.

Using probabilities to provide more information

The 'median' is based on the probability distribution generated by the climate model (MAGICC7) when it takes into account uncertainties in our knowledge of climate sensitivity, the carbon cycle, and effect of greenhouse gases, aerosols, and other factors that are used to calculate the temperatures. The probability distribution enables us to provide more information for policy makers and stakeholders about the likelihood of goals being met, or specific temperatures being exceeded.

The current level of government action is insufficient with temperatures continue to rise into the next century

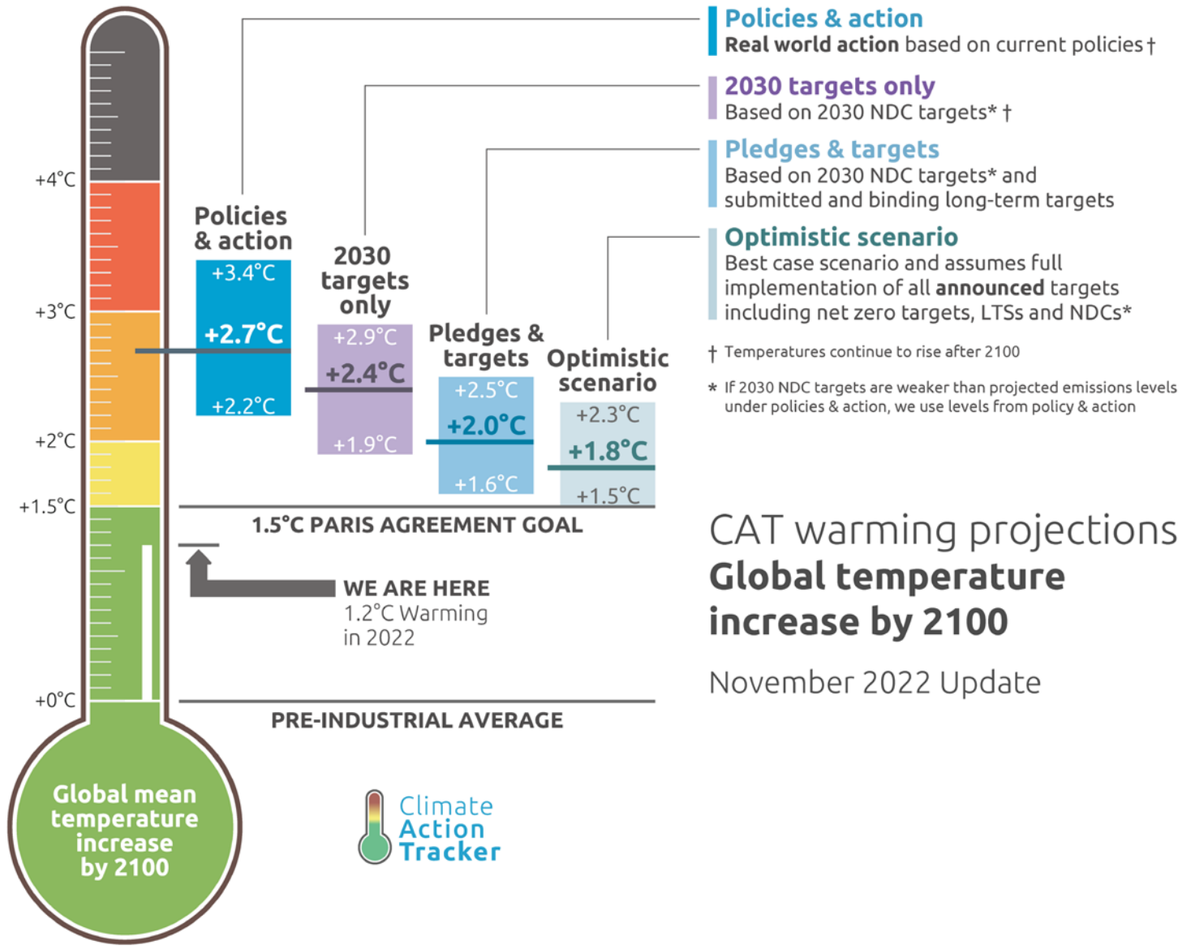
Current policy will lead to a warming of 2.7°C in our combined estimate in 2100 but will also continue to rise after that date. This means, current policies do not limit warming to the level of 2.7°C. Considering only the high estimate of our current policy projection would lead to a warming of 2.9°C and rising, while the low estimate results in a median warming in 2100 of 2.6°C and rising.

November 2022 NDCs likely below 2.6°C and above 95% chance of exceeding 1.5°C

Based on the 2030 targets only,[1] end of century will be 2.4°C (and continue rising after 2100), with over a 95% probability of exceeding 1.5°C. If one includes binding long-term targets, we estimate end of century warming to be 2.0°C, which is likely below 2.2°C and has over a 90% chance of exceeding 1.5°C.

The CAT has also analysed the effect of net zero emission targets adopted or under discussion in around 140 countries and found that median warming could be as low as 1.8˚C by 2100. While an estimate that comes under the 2°C level is an important milestone, it must be stressed that this is based on only a 50 / 50 chance that warming will indeed be limited to 1.8°C by 2100 and 1.9°C at its peak within the century.

[1] For weak targets, we take a country's estimated 2030 level under current policies, if that level is lower than the target.



Further information

For more information on the global emission pathways and how they are calculated, please see refer to our methodology section.

For the latest on NDC updates, please refer to our Climate Target Update Tracker.

Content courtesy of the Climate Action Tracker (2022). The CAT Thermometer. November 2022. Available at: https://climateactiontracker.org/global/cat-thermometer/

Nettlecombe Craft School

"Nettlecombe Craft School was born of a desire to provide a space for people to unite in community and craft. We have felt first-hand the vast and broad benefits that are derived from craft, community and nature, and wish to enable as many people as possible to learn about natural materials and craft skills in this environment."

Jeffrey Hart

Founded in 2023, Nettlecombe Craft School is a multi-disciplinary centre, whose main priorities are to revive the knowledge and understanding of heritage crafts, provide a safe space for people to learn about and engage with such activities, and create a community around these mutually held principles.

Spaces such as these can suffer from a lack of availability to the communities which would benefit the most from them. We believe that everyone should have access to the restorative and creative hub that a woodland provides, and we intend to make our craft school available to as wide a range of people and communities as possible.

Taught by some of the finest and most respected craftspeople in the UK and beyond, we offer courses in a variety of woodland crafts, from basketry to spoon carving, brush making to bowl turning, and foraging to bow making, to mention a few. You'll use hand tools to sculpt natural materials from the woodland, allowing you to fully connect with and really get to know the materials you'll be using, learning skills which you can take away with you to continue on your craft journey.

"The world in which we live is increasingly remote. We often exist separate from one another, so community has become more scarce, whilst loneliness increases.

We provide a space where people can come together in community to learn about natural materials, interact with the natural world and use its resources to create beautiful items sourced from, and in harmony with, the natural world."

Our aims

1. To share our passion for heritage crafts and skills, enhancing the knowledge and understanding of these elements whilst providing a safe, comfortable space from which to achieve these aims.
2. To provide as many of the mental health and well-being benefits that being amongst nature can provide, to as diverse a range of people as possible.
3. To create community around craft and being outdoors, to a broad range of participants who may otherwise not have access to these spaces.
4. To actively manage and support the woodland to create products and services, whilst enhancing the health and biodiversity of the woodland.

Situated in a beautiful woodland on the Eastern edge of Exmoor National Park, Nettlecombe Craft School is the realisation of a long-held dream to create and provide a space for community and craft to flourish. In our workshop, handcrafted from coppiced roundwood Sweet Chestnut, the tranquillity of working with hand tools will allow you to really be a part of your surroundings, feeling the breeze, hearing the birdsong and the rustling of leaves...and just maybe, the kettle gently coming to boil on the campfire.

Craft is more than just design and manufacture, it is deeply rooted in a slower pace, an attuned existence and a more delicate approach to the natural environment. These principles are extremely powerful in creating peace in an increasingly chaotic world, and it is this we hope to share with as many people as we can.

We also host a free monthly Craft Club for those who'd like to enjoy creating around the campfire in a self-led environment – maybe working on your latest spoon, spinning some wool or whatever you fancy. Come along, drink tea, eat soup, meet people, enjoy the space and indulge in craft with other like-minded woodland creatures.

We hope to see you soon.

Full details can be found at
www.nettlecombecraftschool.com

Wild fish and their habitats

"Why do healthy rivers and wild fish populations matter? The short answer is that biodiversity is essential for life to thrive – and that includes us."

Nick Measham

Healthy rivers and fish are a crucial component of a healthy, resilient natural environment. Unfortunately, our aquatic habitats are under incredible pressure – and much more so than our terrestrial world. The impacts of industrial farming on land are clear for all to see. Much of what takes place is our rivers is not easily witnessed but it is every bit as real.

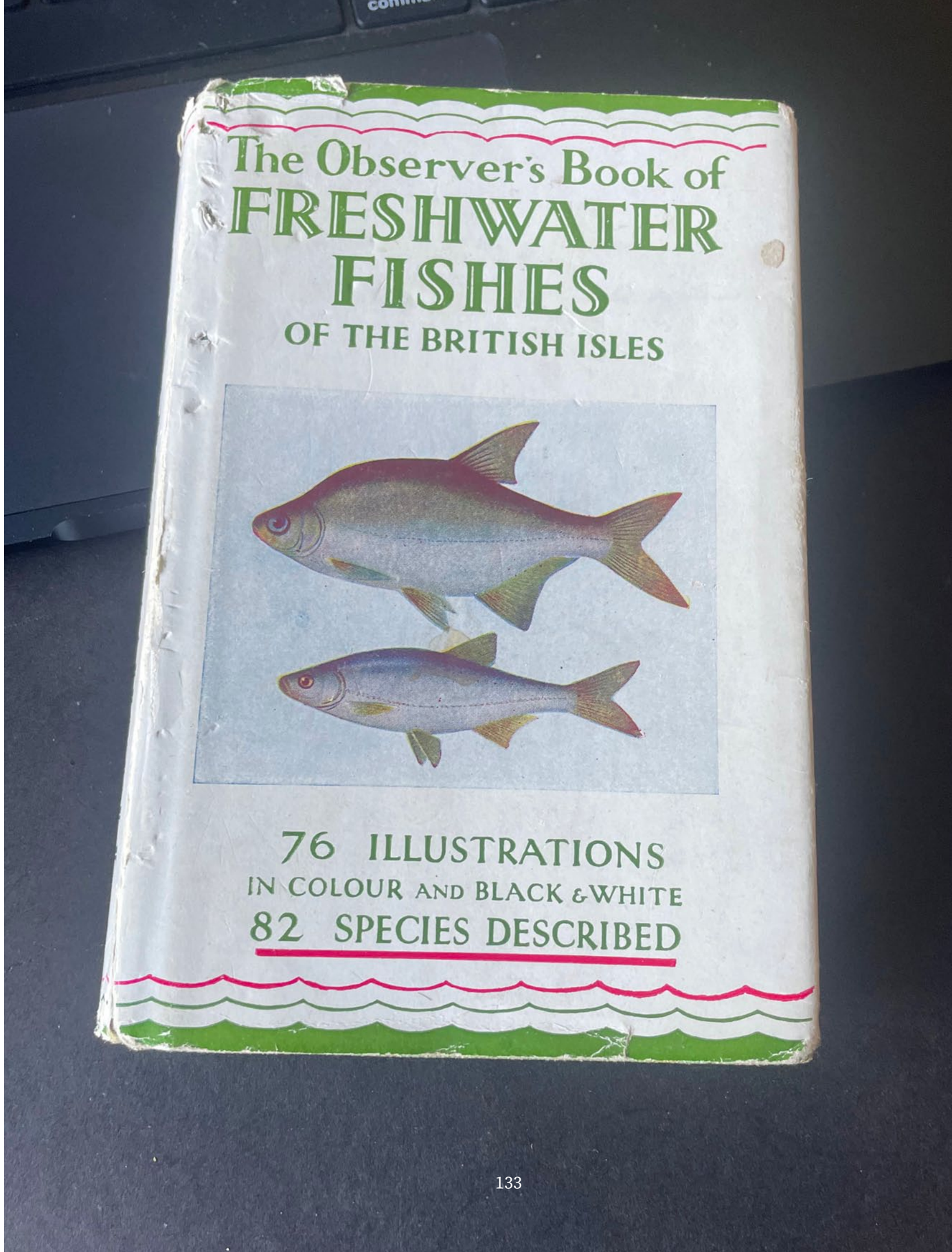
The Environment Agency states only 14% of our rivers are in a good ecological state. Six out of seven rivers are failing and many of the others are declining because "good" is not a good enough standard to stop the rot.

What are the problems? Wild fish need unpolluted water, and they also need lots of it, to provide a flourishing habitat. Our rivers are failing the fish on both counts: they are polluted with sewage and agricultural waste and robbed of water through abstraction to meet the ever-increasing demands of our growing population for drinking, washing, crop irrigation and so on.

Sewage and agriculture are almost equally to blame for pollution. Both are a source of nutrients which promote excess weed and algal growth choking the life out of the water. Both are also a source of chemicals, from pharmaceuticals to pesticides.

Abstraction reduces flow. This concentrates the pollution and increases water temperature – particularly in summer – with disastrous results.

What can be done about it? The good news on pollution is we have regulations which, if applied, would sort out most of the problems from sewage and agriculture. The bad news is that our government chooses not to enforce the rules. It wants keep water bills and food prices low rather than make the polluters invest.



It would be great to highlight a river where the right action is being taken to protect it but there isn't one. Yes, piecemeal actions are being carried out to mitigate the impacts of abstraction and pollution but there is no example of sufficient catchment wide action being taken to address the causes.

Yet that said, I am optimistic that attitudes are changing. WildFish is leading the challenge to fix the causes, not merely treat the symptoms. I want us all to enjoy the benefits of healthy river and their fish. I was once that little child playing in a stream, catching bullheads, stone loach, and insects, captivated by my Observer's Book of Freshwater Fishes. I want to make sure WildFish makes this possible for future generations too.

https://wildfish.org

WildFish.
Working to protect wild fish

WildFish has taken the government to court to force it to apply the regulations on sewage which will require the water companies to invest in treatment capacity to clean up the discharges into our rivers. Similarly, on agriculture, we are working on ways to stop poor farming practises killing rivers with waste from intensive cattle and chicken units plus pesticides and nutrients from arable.

Abstraction is more worrying. We need urgent investment in water supply infrastructure, such as reservoirs, to cut the reliance on rivers but, despite our and others lobbying, there is no sign of action soon enough to protect our rivers and fish. The last reservoir of scale was built in the early 1990s and none currently planned to open before 2035.

WELLBEING

The Archetype of Earth

"In feng shui, there are five elements of nature (wood, fire, earth, metal, and water) and according to Eastern philosophy, each of these elements make up all of creation. Not only as these elements the material of physical matter, unlike the Western elements, they relate to all of unseen energy, or chi."

Maureen Calamia

This is the first article in a series on the five elements.

These elements are sometimes called the five phases, or transformation of chi. That is because they represent how energy shifts, changes, and impacts each of the other elements. There is a process of creation and control (sometimes referred to as destruction). Each element has an element that creates it, another that controls it, and yet another that drains its energy.

This elegant process is so simple, yet profound, in that it describes how the natural world, basically everything in creation, maintains equilibrium and harmony.

Each element has many characteristics and layers that form a depth of knowledge of how the natural world works, including us humans. These elements are expressed as character and personality traits within us. Below is an excerpt from my book, Creating Luminous Spaces: Use the Five Elements for Balance and Harmony in Your Home and in Your Life (Conari Press, 2018), goes into detail about how these elements show up in our lives, representing archetypes of energy and personality traits.

Earth Archetype: The Peacemaker
The Earth Element is the archetype of "The Peacemaker," seeking harmony in the world. It is about the ability to trust and accept love and support from others. It allows you to acknowledge your right to be fully alive and to engage in happiness and love. These are all qualities of balanced Earth.

Earth is the Mother
Earth is the "Mother," providing all the nurturing qualities of the archetype. Although the Mother seems to denote only feminine qualities, men can equally have this archetype. Family and home are the utmost concerns, where she anticipates the needs and cares of others. She works primarily for the ability to provide for her family. Earth provides nourishment for all. The kitchen is the center of activity. She is fruitful, empathetic and resilient and provides healing and forgiveness.

...or the Out of Balance Mother
However, when the Earth Element is out-of-balance, she is plagued by worry and tends to sacrifice of herself for others; she has an inability to set appropriate boundaries in her personal relationships. She extends herself to the point of collapse. An appropriate balance of Earth is recognizing the need to take care of yourself first and to give to others from the spillover. Just like the safety announcement on airlines, put the mask on yourself first and then you can help others. Imbalanced Earth may need to learn that taking care of yourself isn't being selfish; it's mandatory!

Being a strong Fire and Wood type, career is extremely important to me. Juggling a family during my marketing career ascension was a challenge. Being an entrepreneur now, I continually learn that wanting to be everything to everyone can result in burn-out, worry and great self-sacrifice. Needing to please many competing groups, as well as family, has proven to be a sign of our modern times. Guilt and worry can be constant companions until we find ways to nurture ourselves and come back to centre.

Earth is Grounded & Stable
Earth is the ground we walk upon, always there, always available. She is about responsibility and follow through. She prefers to work behind the scenes, keeping everything moving along. She is trustworthy and practical and prefers to work as a team player.

Being grounded is one of my skills. While working on an extremely stressful and tense project, one of my colleagues turned to me and said that she really loved the feeling of calmness and peace that I brought to the project. I was so taken aback because internally I certainly did NOT feel calm and peaceful! That's the power of energy.

…or Stuck and Averse to Change
Stability sometimes leads to stuckness. She can become fearful of change and lost in the past, not clearing seeing the present. She may become overly sentimental, surrounding herself with family memorabilia. Earth can sometimes stay in the same home that they grew up in, or if they must, at least stay in a home for many decades. She often stays in jobs and romantic relationships due to a feeling of loyalty, and, of course, fear of change.

A cousin of ours is always reminiscing about the past to the point that they do not live in the moment or for the future. They have a set meal plan and schedule for chores for the week, which they repeat, week after week; year after year. This is imbalanced Earth to an extreme.

Earth is Proper Boundaries & Support
Earth sees the importance of self-sacrifice for the greater good. She has the capacity to see both sides and is generous in nature. However, she sets proper boundaries. The Mother knows how much to give and how much to withhold. She understands that others need to learn their lessons and she is not an enabler that will keep others bound to her. She provides unconditional love and support, but acknowledges and respects her own needs, desires, and path.

…or Over-Extended and Self-Pitying
Because she is seemingly always available, others may take advantage of her and not return her need to feel nurtured and loved. She has difficulty saying no. Her great desire to be needed at all costs may over-shadow her self-respect.

On the other hand, she often has difficulty accepting love and support from others. She hides behind a cheerful front and appears self-sufficient. She tends to set unrealistic expectations in relationships, and often ends up in disappointment. When exaggerated, she may collapse into self-pity and martyrdom. This state

only exacerbates her belief that she has no support or love. She distrusts people and because she is no fun to have around when in this state, she is often left out.

One of my great parental lessons in life, and perhaps yours, was to know how much to give and how much to pull back. With both of my children I saw the result of being over-involved in their lives and it wasn't pretty. But my fear was that if I pulled back, I would be viewed as a "bad mother," selfish or lacking care. Once I realized and was aware of my over-meddling, I had to care less about what others thought of my behaviour. Again, it was important to come back into balance.

Earth is the Negotiator
Desiring harmony above all, Earth is a great negotiator, seeing both sides. She strives for a win-win outcome for all. She is diplomatic and knows how to work a room! Just like the archetype of the Mother she connects with people and truly hears them. Her empathetic and peaceful presence is a great asset to any group.

When I first started my career in marketing, I quickly learned the power of the Peacemaker. I was an account manager who had multiple parties to please. On one hand I had my clients, who were often obstinate and unreasonable. On the other hand, I had designers, copywriters, and production co-workers that were overworked and stressed. And I needed them to do my work quickly and efficiently. I learned the power of Earth: connection, listening, and negotiating to get what I needed and when I needed it. It was a valuable lesson that has served me well since then.

The archetype of the Peacemaker has been, throughout history, the Mother and all beings which have put others first in their lives. They are the caretakers, healthcare professionals, teachers, advocates, and those dedicated to organizations at the service of others.

The Earth type has several of these features: a generous mouth and full lips, rounded face, a broad bridge of the nose, puffy upper eyelids. They tend to have a roundness to their bodies, large breasts or muscles, and a yellowish tone to their skin (regardless of race).

Too little Earth can result in swollen glands, weak ankles and wrists, varicose veins, easy bruising, and inability to feel full (always hungry). Too much Earth can lead to excessive appetite, water retention, heavy eyes and head, and puffy eyelids.

In her home, the kitchen is where the life is. You cannot visit an Earth person without her fixing you a snack or a meal. Her cabinets and closets stuffed to capacity, perhaps overcompensating for feeling empty inside. Oftentimes, everything is everywhere in her house. She can have a lot of clutter, but to her these items are precious, often sentimental. She has a story for everything and why she needs to keep it.

Curious what True Nature Element you are? Visit her website and take the True Nature Quiz: https://www.luminous-spaces.com/

A Journey of Discovery: How the Rudolf Steiner (inspired) School Changed our Lives

"Imagine waking up in the middle of the night, feeling restless because you're desperately searching for a solution to help your youngest child overcome life's difficulties. That's exactly where my story begins. One sleepless night, as I tossed and turned, a revelation struck me like a lightning bolt: my child needed to reconnect with nature, and the Waldorf Steiner school was the answer."

Odile Smith

Settle down – make yourself a cuppa and get cosy; let me take you on a journey through this incredible experience.

I hadn't stumbled upon the Rudolf Steiner school randomly. I'd been hearing about it for some time through another mother, and occasional friends at parties and gatherings.

I knew it was considered different, an alternative way of educating placing the needs of the child at the centre without judgement and relating to nature, but I needed to know more; So, off I went to explore this mysterious educational world, unaware of what awaited me.

First things first I visited the nearest school (luckily just a handful of Km away from our home) and attended the open day.

The moment I entered the school, something enchanting greeted me: the smell. The scent of wood filled the air, and the aroma of beeswax wafted through the classrooms. It was as if I had stepped into a realm where nature and learning were intertwined. Everywhere I looked, I found exquisite artworks inspired by the natural world. Children were creating beautiful sculptures, knitting, painting with watercolours, and keeping meticulously handwritten exercise books.

It became increasingly clear to me that this was the perfect environment for my youngest child. It was a place where children weren't just following a rigid curriculum but were genuinely cared for and nurtured.

My decision was reinforced by my son's tumultuous early life. I had adopted him from Ukraine when he was about 2 years old, and he had been abandoned at birth and soon put into the system. Those crucial first 2 years of being held, protected, and loved were missing from his life, making him a vulnerable yet incredibly sensitive soul. His inherent capacity for finding joy in life and his profound connection to his surroundings would soon emerge as his greatest strengths in his personal development.

With my heart full of hope, together with my husband we agreed that this was the right path for our son. Standard education would have likely left him feeling even more frustrated and isolated, as we couldn't quite pinpoint whether it was ADHD or simply his profound sensitivity that set him apart.

And so, our journey began. In the first year, I must admit, I had my doubts. The school made the children prepare bread once a week, they sang and danced in the fields, and let them run wild during what was essentially an extra year of kindergarten. It was a chance for my son to reclaim and extra piece of childhood he had missed. I was sceptical at first, but as I watched him grow and thrive, my doubts vanished. He was clearly in his element and was serene when outside and when caring for animals.

The school's approach was refreshing. They encouraged the children to experience the joy of creating developing the intelligence of their hearts through their hands, crafting, exploring their surrounding world. The connection to nature was profound. Beyond the school grounds, they ventured into nearby parks and woods, where they explored, touched, smelled, and connected with the natural world around them. It was nothing short of amazing.

As I tell you our journey, I can't help but reflect on the profound transformation that had occurred in my son's life. The Waldorf Steiner school had provided the nurturing environment he needed, allowing his unique sensitivities to flourish.

One of the most remarkable aspects of the Waldorf Steiner approach was their emphasis on holistic education. It wasn't just about academics; it was about nurturing the whole child – mind, body, and soul. The teachers understood that every child is unique, and they tailored their approach accordingly. This approach wasn't about fitting children into boxes but helping them discover their individuality.

The connection to nature played a central role in this education. I watched my son become more grounded, more in tune with the world around him. He developed a deep appreciation for the environment and a profound sense of responsibility toward it. It was as if the natural world had become his co-teacher, guiding him in ways that traditional classrooms never could.

Nature's spirit took centre stage within the classroom, guiding the entire curriculum and activities as they seamlessly unfolded in harmony with the changing seasons and the essence of nature.

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The school's emphasis on creativity and the arts was equally transformative. My son's ability to express himself blossomed. He learned to knit, paint, and create beautiful sculptures—all inspired by the wonders of nature. These artistic endeavours became not just hobbies but a way for him to connect with his inner self and the world around him, pursuing this even outside the school environment with pride and joy.

As the years passed, my husband and I watched in awe as our son's self-confidence grew. He no longer felt like an outsider; he felt like a valued member of a community that celebrated his uniqueness. The so-called difficulties that once troubled us seemed to melt away as he found his place in this nurturing environment.

In retrospect, I can't help but feel grateful for that restless night when the solution revealed itself to me. The Waldorf Steiner school has been a beacon of hope for our family, a place where our son's vulnerabilities were embraced, and his sensitivities celebrated. It's a place where the magic of childhood is preserved, and the connection to nature is cherished.

Now at 18, as he enters his last year of senior school, he already knows that he would like to pursue his studies in the area of environmental science and become a guardian of the natural world.

So, as I finish my cuppa and my personal story, I hope it inspires you to seek out those unique educational opportunities that can truly transform a child's life. For us, the Waldorf Steiner school was more than just a school; it was a lifeline that breathed new life into our son's world.

www.thebiophilichub.com

PRIORITISING POSTURE: MANAGING TECHNOLOGY AND WELLBEING IN SCHOOLS

Guy Osmond

"In the rush to embrace all the benefits of digital technology, have parents and teachers missed a vital piece around posture, ergonomics, and wellbeing for children?."

Guy Osmond, MD of Osmond Ergonomics, a leader in the field of workplace wellbeing for more than 30 years, explores this question.

Just as in all areas of life, the rise of digital technology has had a huge impact on education, changing how children are taught and learn.

The proliferation of digital devices in schools and at home has undoubtedly opened new horizons – but it hasn't come without harms – not all of which are well understood.

Excessive use of screens can lead to eye strain or headaches, and some studies have even shown a link between screen time and higher risk and severity of myopia. At the same time, a sedentary lifestyle, characterised by long periods spent sitting at a screen, can have a profound impact on a child's physical and mental health, increasing the risk of childhood obesity.

The conversation around managing screen time for children is well-developed, but excessive use isn't the only cause for concern; the manner in which children are using screens – the postures they're adopting, especially over prolonged periods – is another potential source of harm.

I would argue that more must be done to educate parents and teachers about the importance of posture and ergonomics. If not, we will see children suffering the consequences of sitting in awkward and unhealthy ways.

Applying ergonomics thinking

In most workplaces, there is at least a basic understanding of the need to ensure the workstations are set up in such a way that protects workers' health, allowing them to be comfortable and productive. For example, by adjusting the chair, desk, and screen to the correct height for an individual.

In fact, it is a legal requirement for employers to conduct a Display Screen Equipment assessment for any employee using a screen for more than one hour at a time, to ensure that they are not putting that person at risk. The same protection doesn't apply to children in schools – or anywhere else.

Failure to prioritise posture can have serious consequences, especially for young children whose bones and bodies are still developing; I work with physiotherapists who are now regularly seeing children as young as eight, treating issues such as 'tech neck', as it's been dubbed – pain and damage to the neck and upper spine linked to the prolonged use of smartphones, tablets, and other handheld devices.

It is the commonly adopted hunched posture, rather than the time spent on the device, which is the cause of this. The effects on a child's health and wellbeing can be significant, with pain impacting on mood and sleep quality. And if poor posture habits persist into adulthood, it can result in chronic musculoskeletal issues.

To mitigate the risks, the onus falls on educators and parents to emphasise proper posture, alongside the importance of limiting screen time.

Encouraging pupils to maintain a comfortable posture while using digital devices, taking regular breaks, and adjusting screen brightness and font size can reduce the negative effects. If they are using laptops for any length of time, a separate keyboard and mouse and a laptop raiser to lift the screen to the correct height (top of the screen at eye level) are the bare minimum requirements to support a healthy posture.

In an IT suite especially, schools should provide adjustable chairs to better accommodate the wide variety in height and other anthropometrics of their pupils, all growing and developing at different rates. Educators might also consider incorporating ergonomics and posture education into their curriculum, while parents can likewise ensure children have a healthy screen set up at home, while also setting screen time limits and encouraging outdoor physical activity.

Getting outside

In my field, even as we support people to adopt better working postures, we understand that no posture is healthy if it is maintained for too long – the key is shifting posture and incorporating breaks and movement.

For children this is even more essential; the current recommendation in the UK is that children should get an average of at least 60 minutes of moderate or vigorous intensity physical activity a day to help them develop movement skills, muscles, and bones. Many are not meeting this target, with only around half of six-year-olds in the UK doing so, according to research published last year. (Hesketh et al, 2022)

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In the age of screens and the dominance of indoor learning, getting outside holds immense value for children, not only as a means of enjoying physical activity. Nature can be a powerful teacher, offering opportunities for exploration, creativity, and experiential learning.

And anyone who has taken a walk to clear their head during a stressful day in the office can tell you that time spent outdoors is a perfect counterbalance the negative effects of excessive screen time.

We know our digital devices make wonderful servants, but bad masters. Proper management, more education about posture and ergonomics, and striking a balance with movement, physical activity and time spent outside, are all vital if we want to harness their potential in education, without undermining children's health and wellbeing in the process.

https://ergonomics.co.uk

References

Hesketh, KR et al. Activity behaviours in British 6-year-olds: cross-sectional associations and longitudinal change during the school transition. *Journal of Physical Activity & Health; 11 Aug 2022*; Available at: https://journals.humankinetics.com/view/journals/jpah/19/8/article-p558.xml (accessed 05 October 2023).

Neuroarchitecture and Biophilic Design

An Integration for Enhanced Learning Environments

Prakash Nair, AIA and **Dr. Parul Minhas**

As modern lifestyles gravitate increasingly towards an indoor-cantered existence, the environment where children gain knowledge, traditionally known as learning environments, has mirrored this shift. Once an interactive, hands-on, and outdoor-centric experience, learning has transformed into predominantly an indoor activity. This disconnection from nature, according to research in neuroarchitecture , has led to the elevation of stress hormones such as cortisol, and we are seeing this even in children.

The interdisciplinary field of neuroarchitecture, a harmonious fusion of neuroscience, psychology, and architecture, offers insights into the effects of our built environment on brain function, behaviour, and well-being. It suggests that by incorporating elements of nature into our learning environments, we can mitigate stress, boost hormones like serotonin and endorphins, and enhance the learning experience for children. Biophilic Design should be a key strategy within neuroarchitecture.

In the context of learning environments, Biophilic Design aligns with the primary goals of neuroarchitecture. It aims to enhance students' self-worth, instil a sense of security, promote a sense of freedom and agency, encourage stability and balance, and foster a sense of belonging, place, and purpose.

This integration of neuroarchitecture and biophilic design principles can significantly elevate the quality of learning environments, aligning them with the essential goals of neuroarchitecture. These goals aim at improving productivity through optimal lighting, temperature, and acoustic conditions; enhancing well-being by designing comfortable spaces integrated with nature and maintaining good air quality; promoting health by incorporating ergonomic furniture and active play areas; facilitating social interaction through flexible seating arrangements and social spaces; and aiding in special education by reducing sensory overload and providing clear navigational cues.

Have a look at this table to get an idea of how Biophilic Design elements contribute to learning benefits, health benefits, and the reduction of stress and improves mood:

Biophilic Design Element	Learning Benefits	Health Benefits	Stress Reduction
Natural Light	Enhances concentration and productivity	Regulates circadian rhythms, improves sleep	Lowers cortisol levels, enhances mood
Plants and Green Spaces	Promotes creativity and curiosity	Improves air quality, reduces respiratory issues	Decreases stress, stimulates serotonin
Water Features	Stimulates calm and peace	Reduces anxiety, induces relaxation	Reduces cortisol levels, induces calm
Nature-Inspired Textures	Bolsters sensory learning	Encourages tactile exploration, reduces sensory overload	Facilitates sensory relaxation, improves mood
Views of Nature	Boosts mental engagement	Stimulates relaxation, lowers heart rate	Stimulates endorphin release, reduces stress

As the table shows, biophilic design as a neuroarchitecture strategy is not just about beautifying learning spaces. It is about making them healthier, happier, and more productive environments that lower stress and enhance the well-being of students. As neuroarchitecture continues to gain momentum, its marriage with biophilic design will undoubtedly play a significant role in shaping future learning environments.

Around the world, we have seen successful implementations of these principles. The American Embassy School, New Delhi, India, is one such example, where natural light, green spaces, and views of nature are integral parts of the school's design. Similarly, the Anne Frank Inspire Academy in San Antonio, Texas, boasts of an environment enriched with indoor and outdoor plants, water features, and ample natural light, fostering a sense of belonging and agency among students.

The Green School in Bali, Indonesia, is also a prime example. The school, primarily constructed of bamboo, integrates the local natural landscape into its design, creating an environment that cultivates a sense of belonging and place among students.

In conclusion, the benefits of integrating neuroarchitecture and biophilic design principles into our learning environments extend beyond academic achievement. From reducing stress hormones to stimulating happiness inducing hormones, these design strategies not only foster a conducive atmosphere for learning but also promote overall well-being, thus preparing students for the future in a holistic manner. It's time we reconsidered our approach to designing learning environments, adopting a path that nurtures our children's connection with nature, fulfilling their cognitive, emotional, and physical needs in harmony.

https://educationdesign.com

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Nurturing Brilliance through Nature:

The Role of Biophilic Architecture in Cultivating Focus and Creativity in Education

IDr. Marivic T. Sambo, PIID

Just weeks before the COVID-19 lockdown, I had the opportunity to revisit my former school – Assumption Antipolo in the Philippines. Accompanied by a couple of old high school friends, we embarked on a nostalgic journey down the familiar pathways that had played an integral role in shaping our early years.

Assumption Antipolo has long been committed to providing a holistic and environmentally conscious education. Designed by the Filipino Architect Felipe M. Mendoza, the campus and its buildings are considered among the architectural legacies of the nation, as he was honored by the United Architects of the Philippines in the 1990s. His style is characterized by its simplicity, avoiding frills and ornamentation, with nature being an integral factor in his design. This design language, coupled with more recent additions such as the PACEM Eco Park, solidifies the school's reputation as a leader in biophilic design.

Education is not solely confined to textbooks and lectures; it is a dynamic interplay between minds and the spaces that nurture them. From a young age, students at the school are provided with ample opportunities to connect with nature, an integral aspect of their holistic education. The architecture seamlessly integrates the outdoors with the indoors, blurring the lines between exterior and interior spaces and expanding the visual boundaries of the internal area. Cognitive skills are sharpened: concentration, problem-solving, creativity while also doing the important work of nurturing emotional and social development. Stress reduction sanctuaries are found in natural settings – bolstering emotional well-being and fostering self-esteem. Fostering creativity through biophilic design is a testament to the profound connection between natural surroundings and enhanced creative thinking. These early exposures to natural environments significantly contribute to shaping the cognitive and holistic development of children. In contemporary educational settings, biophilic architecture thoughtfully integrates nature into the learning environment.

Moreover, the unstructured play and social interaction opportunities afforded by nature enhance cooperation and communication skills. In the physical realm, outdoor play promotes fitness and overall health, while sensory engagement heightens sensory awareness. Children develop a connection to the environment when they immerse themselves in nature - with a heightened awareness and a sense of responsibility for its preservation. Early exposure to natural environments broadens cultural awareness and provides a foundation for a lifetime of environmental stewardship. In essence, nature becomes a holistic classroom, cultivating well-rounded, environmentally conscious, and emotionally resilient individuals.

Creating environments for focus and learning is a multifaceted endeavor; and biophilic architecture plays a pivotal role in crafting conducive learning spaces. Biophilic architecture harnesses the innate human connection to the environment by incorporating natural elements and design principles inspired by nature. The effects of biophilic design is its ability to instill calmness, reduce stress, and enhance attention. The presence of natural light, living greenery, and outdoor views within educational settings have a soothing influence on students, fostering an atmosphere where they can concentrate better and learn more effectively.

The design of Assumption Antipolo incorporates elements of tropicalism and biophilic architecture as Arch. Mendoza's design philosophy is rooted in nature and ecological considerations.

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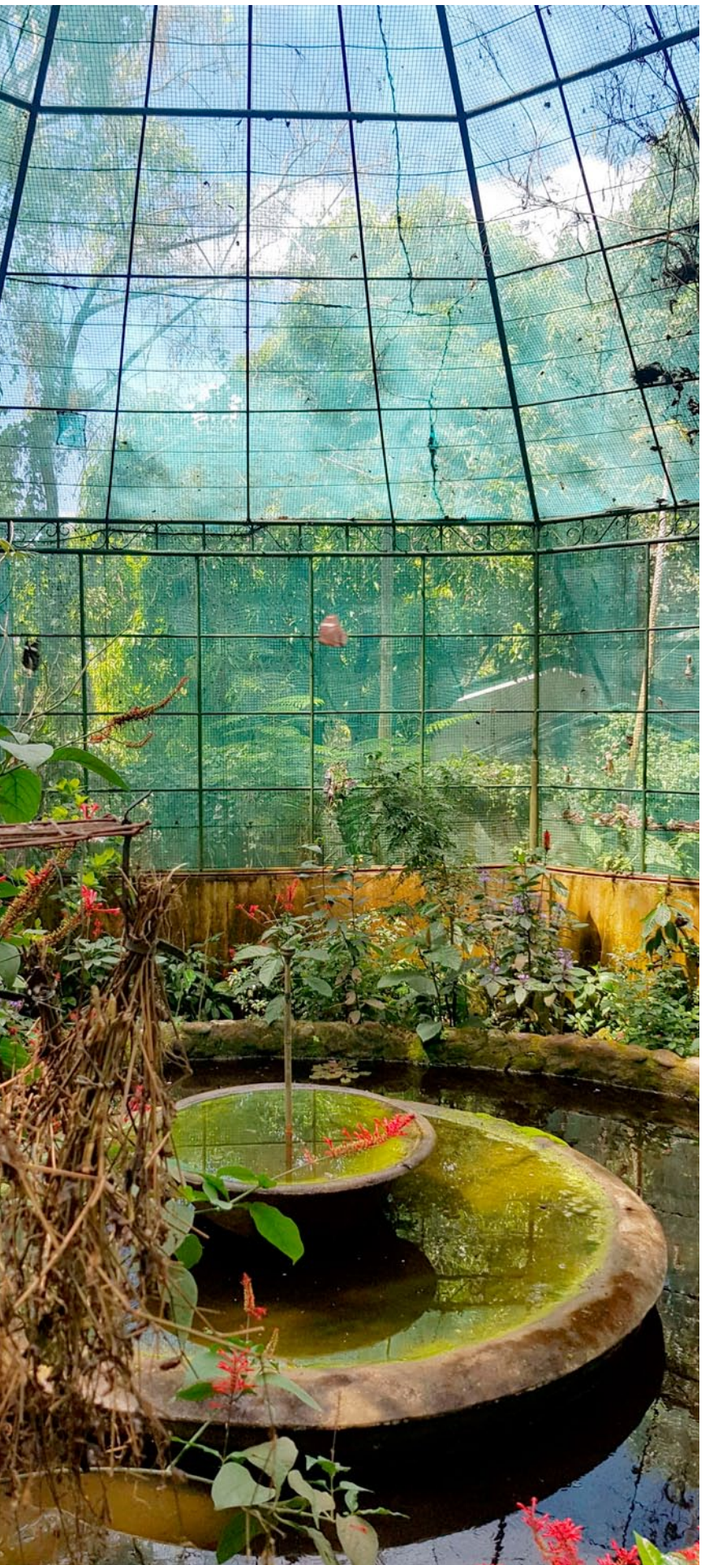
The meticulously planned orientation of structures maximizes the use of natural light and ventilation to their fullest potential. This reduces energy consumption and connects the users with the natural rhythms of daylight. His design approach aligns with his commitment to creating architectural spaces that seamlessly merge with the environment, forging a harmonious connection between the built and natural worlds. By employing expansive openings and generous eaves, it effectively blurs the rigid distinctions between the exterior and interior, creating an architectural framework that is nearly porous. This permeability allows the structure to seamlessly interact with the tropical surroundings, infusing architectural forms with a contemporary essence while preserving a tropical flair. These elements and more serve to create a sensory-rich environment that engages students with the sights, sounds, and textures of nature. Hexagonal classroom clusters, with openings at their centers, bring the outdoors inside, allowing students to connect with nature even during indoor activities. Hexagonal tables in younger grade levels facilitate group work, encouraging collaboration in an environment inspired by the natural world.

Assumption Antipolo is an inspiring model of how biophilic architecture can positively influence educational environments. Nestled amid the lush green hills of Antipolo, this institution has seamlessly integrated nature into its design, fostering an environment that nurtures and motivates its students.



Looking ahead, the future of education holds immense promise as it embraces biophilic design principles. Envision educational architecture evolving to prioritize the seamless integration of nature into learning spaces. Picture classrooms that resemble sunlit gardens and libraries that evoke the serenity of a forest, serving as catalysts for creativity, focus, and holistic development. These spaces could extend beyond traditional school buildings into outdoor learning environments, encouraging experiential education and a deeper connection with nature. Moreover, technology could integrate into these biophilic spaces, enhancing the learning experience while maintaining a vital connection with the natural world.

To realize this vision, collaboration among educators, architects, and policymakers is paramount. Educators can offer valuable insights into students' specific needs and curriculum requirements, ensuring that biophilic design aligns with learning objectives. Architects can leverage their expertise to create functional and aesthetically pleasing biophilic spaces that adhere to sustainability standards. Policymakers play a crucial role by advocating for and incentivizing the incorporation of

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biophilic design in educational infrastructure, providing the necessary resources and regulations to make it a reality. Together, these stakeholders can drive the transformation of educational environments, fostering a more holistic and harmonious relationship between students and the natural world, ultimately shaping a brighter future for education.

While nurturing brilliance through nature via biophilic architecture in educational institutions presents a compelling vision, it is not without its share of challenges: practical implementation, customized approaches, and budget constraints stand as significant hurdles. This isn't an overwhelmingly difficult challenge that would warrant a too-basic explanation suggesting that these obstacles are easy to overcome. Instead, it requires collaborative efforts, creative funding solutions, and raising awareness to cultivate a profound understanding of the long-term benefits of integrating nature into the learning environment. In the end, ongoing investments in biophilic design have the potential to significantly influence students' academic performance and overall well-being, making it a promising avenue for the future of education.

From City to Sanctuary

How to create a haven for a city worker

Cinzia Moretti

The primary objective for designing this office space was to craft an environment that exuded both comfort and personality. My client, a businesswoman working in the city surrounded by grey dwellings, yearned for a haven that would serve as an escape from this monotonous urban landscape. When the opportunity arose to create her own home office, she was determined to infuse it with elements that would provide solace and refuge from the grey and sterile surroundings. A lover of plants and everything natural, her foremost desire was to incorporate organic shapes and elements that would not only enhance the aesthetics but also evoke feelings of relaxation and security within her private workspace. It was evident that introducing Biophilic design elements was the most fitting and harmonious approach for this project, to evoke feelings of tranquillity and refuge.

To bring the concept to life, the design incorporated a plethora of organic shapes, textures, and materials. Natural wood, with its warm and inviting tones, was chosen as the primary material for furniture and flooring. The rich wood tones and orange accent not only added a touch of elegance but also evoked a sense of grounding and natural comfort. The furniture was crafted to mimic the gentle curves and irregular forms found in nature, ensuring that every piece had its unique identity. The colour scheme is inspired by the colours of Autumn.

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In addition wood, brass and natural fabrics were introduced throughout the space, both as decorative elements and practical features. These textures, combined with a carefully chosen earthy colour palette, inspired by Autumn created an environment that felt organic and alive.

One of the most striking elements of the Biophilic design was the incorporation of lush greenery. Various plant species were strategically placed around the office, not only for their aesthetic appeal but also for their air-purifying properties. Potted plants and plants on shelves, contributed to the office's living, breathing ambiance. The presence of these plants brought nature indoors and provided a refreshing and rejuvenating atmosphere.

To enhance the sense of cosiness and security, the lighting design played a were carefully selected to mimic the gentle glow of sunlight filtering through leaves in a forest. Dimmable lights allowed for flexibility in creating different moods, ensuring that the space could be adapted for work, relaxation, or creative activities as needed.

"*Biophilic Design is important in focus spaces because research studies have proven that the use of direct nature or indirect nature can affect our mood and behaviour. For instance, using plants in your work environment and your home office, has many benefits. Some specific plants have a purifying effect, helping to reduce stress, and to increase and boost creativity.*"

Cinzia Moretti is Creative Director for Moretti Interior Design Ltd

https://morettiinteriordesign.com

FINAL WORD

Dr Vanessa Champion
Editor

It has been a busy few weeks. I was lucky enough to interview Charlotte Church at her beautifully designed and inspiring retreat "The Dreaming" in Wales. Listen out for the videocast with her I recorded this month. It's a stunning place, my friend and inspirational biophilic design and sustainability consultant Clare Bowman suggested I connect. Clare had advised and worked on the interiors, stunning, and an epitome of Biophilia, if you get the chance. Go visit! The retreat will do you the world of good too. It's in Laura Ashley's old house, and the design honours her spirit of creating a place that is beautiful and connected to nature.

Three degrees of separation, my other friend Simon Howard had designed the Stained Glass in there, if you need nature-inspired stained glass look him up! Say I sent you! Lovely guy.

I was also thrilled to be asked to give a lecture on the Trends I'm seeing in Biophilic Design to some brilliant students at KLC School of Design. One of the students who was in the audience of one of the lectures shared this "magic brush" with me:

"I would say that, first of all, I would change the way we design kids' spaces. Nurseries, schools, and playgrounds should all reflect the importance of the biophilic approach. After all, children will take care of our environment and the planet in the future. I would also make studies of the environment, sustainability and health implications of nature a vital part of the national curriculum." Maria Kartalova, Interior Design Degree Student

It is encouraging that the next generation of designers embrace biophilia in all it's guises, nature connection and within the design context too, for people's wellbeing and the planet's too.

If you'd like to learn more, why not visit The Space Doctors learning platform and check out Issue for 2023 September – Learning Spaces www.thespacedoctors.com and also visit "The Science and Research" tab on our site journalofbiophilicdesign.com and create your own report on how Biophilic Design supports learning. Let us know what you think.

Do you have a case study you are involved in you would like to share?

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