

Biophilic Design

A USC Well-being Collective Toolkit



September 2020

USC Well-being Collective

The USC Well-being Collective harnesses the power of Collective Impact for a variety of distinct and often siloed academic departments, administrative units, recognized student organizations and local non-profits to come together and work with the whole student community towards our common agenda: **strengthening a campus culture driven by student wellbeing.**

This goal is supported by four interrelated strategic goals:

Equity and Inclusion – enhancing the culture of equity and inclusion

Resilience and Thriving – creating a culture where individuals and communities thrive

Alcohol and Other Substance Use – disrupting the culture of at-risk substance use

Consent and Healthy Relationships — fostering a culture of consent and healthy relationships

Introduction

Today, mental health professionals have access to various levels of treatment that can effectively help people with a variety of mental health concerns. Many colleges are going beyond simply providing treatment services by expanding efforts to prevent mental health problems from arising and to promote the mental well-being of all students. In other words, they are adopting a public health approach to address the social and environmental risk factors that influence student mental health (Davidson & Locke, 2010; SPRC, 2004). Factors affecting student mental health and ability to thrive can be shaped by individual attitudes and beliefs about mental illness, interpersonal group norms, institutional environments, community access to mental health resources and public policies. With the practice of connecting young people early to mental hygiene skill building, emotional support and treatment, institutions can cultivate a culture where individuals and communities thrive.

Biophilic design creates spaces that are restorative, health-promoting, and integrative within functionality of both the place and the ecosystem to which it is utilized. Biophilic design acknowledges various influential environmental factors can affect indicators of health and well-being. Objects and elements of the natural world are incorporated into the built environment of the space. These natural elements encompass both living and artificial representations of the natural world, examples range from live plants to photographs of landscapes. Routine connections with nature promotes mental hygiene and thriving, as experiences of natural environments altogether provide greater emotional restoration, with lower instances of tension, anxiety, anger, fatigue, confusion and mood disturbance than urban environments with limited characteristics of nature. (Alcock et al., 2014).

Biophilic Design

Toolkit Description:

Incorporating biophilic design in space planning

Strategic Goals:

Equity + Inclusion

Thrive + Mental Health

At-Risk Substance Abuse

Consent + Healthy Relationships

Strategies:

Building healthy public policy

Creating supportive environments

Strengthening community action

Developing personal skills

Re-orienting all sectors towards prevention

A Toolkit For:

Faculty

Staff

Student

Parent/Guardian

Administrator

Goal

Biophilic design is the deliberate practice of incorporating elements of the natural world into the built environment to positively impact human well-being. This toolkit aims to provide ideas and strategies for incorporating biophilic design in the educational setting in order to foster positive mental health and community well-being.

Intended Outcomes

- Physiological stress reduction (Grahn & Stigsdotter, 2010; Salingarios, 2012; Alcarsson et. al, 2010; Yin et. al, 2018)
- Improved information processing and attention (Hunter et. al, 2010)
- Improved memory and motivation (Jahncke et. al, 2011)
- Increased productivity and workplace satisfaction (Gray & Birrell, 2014)

Evidence of Effectiveness

Scientifically Supported - Strategies with this rating are most likely to make a difference. These strategies have been tested in many robust studies with consistently positive results.

Implementation Ideas

For Faculty/Students/Staff

Natural analogues can be integrated into buildings, meeting spaces, lounges and rooms. This could include potted plants, living walls, plant installations, wood/ stone or other natural elements, and indoor water fixtures. To the extent possible, attempt to position workstations or desks in view of natural light and natural landscapes.

When natural analogues are not available, the following can be used, which have been found to have similar effects:

- depictions of natural landscapes and greenery
- artificial plants/ greenery
- ED lights that adjust their color over the course of the day to mimic the sun
- images of trees, leaves, forests, or other natural elements on screens (e.g. residence halls, academic buildings)
- Nature-inspired/ 'earth-tone' color palettes and shapes (e.g. blue, green and yellow palettes; more natural, curved organic forms of furniture or artwork as opposed to geometric shapes like squares and triangles)
- Calming, natural tones on rugs and window coverings
- Playing natural sounds (e.g. birds, water etc) in busy areas such as dining halls

Administrator

Campus planners can commit to biophilic design principles for renovations and construction of new campus areas.

Policies for utilization of natural materials and colors: leather, stone, copper, bronze and wood

Campus planners may construct additional campus areas as wildlife habitats (birdhouse, honeybee apiary; hedges, flowering vegetation)

Implementation Resources

[Terrapin Bright Green: 14 Patterns of Biophilic Design](#)

References

Alcock, I., M.P. White, B.W. Wheeler, L.E. Fleming, & M.H. Depledge. (2014). Longitudinal Effects on Mental Health of Moving to Greener and Less Green Urban Areas. *Environmental Science & Technology*, 48 (2), 1247-1255.

Alvarsson, J., S. Wiens & M. Nilsson (2010). Stress Recovery during Exposure to Nature Sound and Environmental Noise. *International Journal of Environmental Research and Public Health*, 7 (3), 1036-1046.

Grahn, P. & U.K. Stigsdotter (2010). The Relation Between Perceived Sensory Dimensions of Urban Green Space and Stress Restoration. *Landscape and Urban Planning* 94, 264-275.

Kellert, S.F., J.H. Heerwagen, & M.L. Mador Eds. (2008). *Biophilic Design: The Theory, Science & Practice of Bringing Buildings to Life*. Hoboken, NJ: John Wiley & Sons.

Produced Examples

Biophilic Design

DEFINITION

Biophilic design is a revolutionary design trend that focuses on the human connection between nature and the built environment.

Examples of Biophilic Design

Noticeable Benefits of Biophilic Design

- \$30 MORE** per sq. ft. for office space
- 30%** faster time to market
- 10%** increase in productivity
- 20-26%** increase in employee retention
- 8.5%** increase in employee satisfaction

Six Principles of Biophilic Design:

- 1. Environmental Features:** Visual and tactile connections to natural elements and processes.
- 2. Natural Shapes and Forms:** Organic forms and patterns that evoke natural elements.
- 3. Natural Processes and Patterns:** Visual and tactile connections to natural elements and processes.
- 4. Light and Space:** Visual and tactile connections to natural elements and processes.
- 5. Place-Based Relationships:** Visual and tactile connections to natural elements and processes.
- 6. Evolved Human-Nature Relationships:** Visual and tactile connections to natural elements and processes.

The WELL Building Standard®

DEFINITION

The WELL Building Standard takes a holistic approach to health in the built environment addressing behavior, operations and design.

The Seven Concepts of the WELL Building Standard

- 1. Air**
- 2. Water**
- 3. Nutrition**
- 4. Light**
- 5. Fitness**
- 6. Mind**
- 7. Comfort**

Quantitative Requirement for Biophilia:

Potted Plants and Planter Beds: minimum of 1% of the floor area, per floor

Green Walls: minimum of 1% of the floor area or 1% that covers the largest available walls, whichever is greater

Example: 8000 sq ft Office
 100 sq ft of planter beds or 100 sq ft of green wall, which is an amount equivalent to greater than 100 sq ft of floor area.

In the first office to be WELL Certified™ — Fitel Program, CBRE Corporate Headquarters, employees responded with the following survey feedback:

- 83%** feel more productive
- 100%** feel that their office air is fresher than their office
- 92%** feel that their office has a better view than their office
- 94%** feel that the new space has a better overall quality than their office

More than 36.2 million square feet of projects have already registered or earned through WELL.

THE BENEFITS OF BIOPHILIC DESIGN

"Biophilia is our instinctive human love of nature, and it is behind a growing design movement in workplaces that is making employees healthier and more productive."

PLANTS IN THE WORKPLACE

Companies like Etsy, Airbnb, Amazon, and Microsoft are going beyond the occasional desk plant and bringing "green" office design to a **new standard**.

PROMOTE EMPLOYEE WELLBEING

- 37%** lowered tension and anxiety levels
- 44%** reduced feelings of anger
- 38%** reduced fatigue

Research found introducing plants to the workplace lowered tension and anxiety levels by 37%, while reducing feelings of anger by around 44%. Additionally, fatigue was shown to have been reduced by 38%.

+15% CREATIVITY

employees whose offices included natural elements scored 15% higher for creativity.

+15% PRODUCTIVITY

employees who worked in environments with biophilic design elements were 15% more productive.

ATTRACT & RETAIN EMPLOYEES

Employees are now taking the quality of their current and potential work environments into consideration. For many, a large portion of their day is spent working onsite. Having a space with biophilic elements is a competitive advantage for employers.

WOULD YOU WANT TO WORK IN A COLD, DARK SPACE?

- 47%** of workers have no natural light
- 58%** of workers have no plants

A quality workspace design leads to a less stressful and more productive atmosphere.

HEALTH BENEFITS

PLANTS REDUCE DUST & BACTERIA

one plant for every 3 employees reduces CO2 levels by **20%**

DIRECT EXPERIENCE OF NATURE

- Light
- Air
- Water
- Plants
- Natural Landscapes

#BringNatureIndoors

INCORPORATING BIOPHILIA

It doesn't all have to be green. Plants come in a wide variety of colors and textures, and that's before even considering flowers. Plus, there are other ways of incorporating nature into the workplace...

1. Add greenery, potted plants, living walls or flower gardens
2. Design outdoor spaces, such as staff gardens
3. Maximize natural lighting

Other Biophilic Elements

Natural materials and colors, water features, naturalistic shapes and forms

Learn more at GPCB.org

SOURCES

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USC Student Health

Office for Health Promotion Strategy
Backbone for the USC Well-being Collective

The Office for Health Promotion Strategy, backbone for the USC Well-being Collective, is embedded in USC Student Health and serves as the administrative core to support campus partners in aligning their strategic objectives with student wellbeing. The Office for Health Promotion Strategy works with participating partners, the Steering Committee, and most importantly, students to activate change at USC.

For additional questions, please contact: USC Student Health, Office for Health Promotion Strategy, Backbone for USC Well-being Collective at wellbeingcollective@usc.edu

USC Well-being Collective

uscbwellbeingcollective.usc.edu