The Living Library

(Re)Design Innovative Challenge

Supporting Document

In this document, we expanded upon our design and each of the four key areas proposed by our new garden design: Equity and Access; Sustainability; Health; and Knowledge Generation.

Design:

As you arrive in the library you’ll pass under a beautiful pergola, providing shade to the main bicycle rack and enticing you to venture beyond into the garden space. You’ll emerge into the garden to the main activity area filled with flexible garden beds, living furniture, and lots of space to sit and meet with friends. The garden entrance is transformed from its current state to a glorious natural green walls and pergolas which integrate the bike space into the garden and encourage the bikers to further explore the garden using biophilic design principles of mystery. Emerging into the main space you can see many of the different elements that make this garden special.

A historic challenge of the space has been in fixed layout and heavy objects that are difficult to move. The flexible configuration of our design makes the space multipurpose enabling it to adapt to the seasons and to its audiences. It incorporates garden beds on wheels, allowing user to redefine their space regularly to suit the weather, an event, or their mood. A blackboard wall will enable faculty, students, and community groups to bring their teaching into the garden. The blackboard and green wall behind also serves as a visual and auditory barrier to the noisy generator. The dunes, and deciduous Boston ivy fence, depicted in cross section also, provide additional noise insulation, while providing shade in summer and light during the winter.

We have designed movable beds that can be constantly redesigned depending on seasons, plants and events. These two beds are designed so that one can fit underneath the other, allowing it to be stored away during winter to create more space and extended during warm months for greater planting area. They are made of wood to reduce life-cycle greenhouse gas emissions. All include inbuilt drip irrigation thank can be linked together to the same hose to make watering easier and more efficient. We also have a water tray that sits under the garden bed to catch excess water so it can be recycled and doesn’t create mold. The tray can double as a seedling tray in the spring. Finally, we have included removable plaques with plant information to enable gardeners to educate the wider community about what they are growing and why.

Our third planter design brings the library into the courtyard, leveraging existing expertise with medicinal plants and enabling that to be shared with the wider community. Rather than books, visitors will browse through medicinal plants and herbs. Planter beds incorporate reusable and sustainable materials and flexible labeling systems to convey information. Our water catchers will collect rainwater that can be used in watering cans while signs provide information on water saving measures in the home.

Throughout the garden we make use of passive solar design principles. This pergola is covered with deciduous vines form a shaded oasis in the summer while letting sunshine and warmth into the garden during the winter. Existing furniture is complimented by new seating options and these side tables. Made from recycled wood and concrete, they have wood pockets that can be opened to plant small herbs and flowers then closed in the winter.

Team Biophilia
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Right by the pergola, to help protect against the noise of the generator, is an aquaponics system. This integrated fish and plant system will introduce garden users to regenerative, technologically advanced farming techniques that can be adapted for home or large scale production. We hope this will be used for experimentation as well as individual gardening.

**Sustainability:**

Brick paving makes the garden unbearably hot during the summer. Our design incorporates green walls, pergola’s covered in deciduous vines, and areas with white paint to reflect the sun’s ray that will absorb excess making the garden more resilient to the extreme temperatures expected in the future. The south-facing aspect of the garden makes the library wall ideal for a vertical solar photovoltaic feature wall that can be added as funding permits.

Water efficiency is paramount to the future of the garden. Climate change predictions indicate that rainfall patterns will become increasingly less predictable stressing the plants and gardeners who care for them. Our design incorporates aquaponics. In this system the waste produced by fish supplies nutrients to the plants, while the plants filter the water. These systems do not require the constant watering of a soil-based garden bed and are more sustainable than using other fertilizers. The increase in water efficiency and locally-based water and fertilizer solutions will reduce the emissions intensity of the gardening activities. The space will also include bike racks on the side and recycling and composting stations.

**Health and Knowledge Generation:**

Studies also show that the experience of nature is profoundly important to human functioning, health, and well-being. Health, as defined by the World Health Organization, is a “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (WHO, 1948). Urban green spaces increases social interactions and social capita and builds stronger community relationships. The garden, designed on biophilic principles, provides a diverse space to de-stress, be alone or be in the company of others, read a book or discuss a book, eat lunch, gather, study, conduct group activities, and hold small and large events. Additionally, garden provides a refuge from environmental and health stressors of urban living and the demands of work and schooling. Trees, plants, and vegetation proposed in the space can dampen ambient noise, improve air quality, cool the space, and be a source of food security (1).

The visuals and auditory connection with nature via diverse plant beds, green walls, pergolas to filter in light, shaded overhangs, wood-based furniture, water flow from aquaponic fish tanks, and wind chimes are designed to reduce stress, increase feelings of tranquility, lower blood pressure and heart rate, improve comfort and cognitive performance, and positive emotional responses and mental health, consistent with the literature on biophilic designs (2).

**Equity, Accessibility, and Usability of space:** To address and promote equity and access, the space will no longer be gated, will continue to be ADA accessible, and be open 24-hours. We believe that to truly be a community space and to truly maximize the benefits of such a space, it needs to be accessible to and by all. Signage for space and garden beds will also include braille to be accessible by the blind or visually-impaired. To increase use of the space, we will also have wireless Internet access, water fountains, electrical outlets, and areas with overhead coverage for rainy weather.

**Safety and Security:** Additional lighting, as well as an emergency call box and security cameras, to ensure visibility and safety of the space, especially at night time.

**Space for social engagement, health, and ideas:** Within the community space we will hold weekly and monthly activities that will promote knowledge generation, health and well-being, and social and cultural diversity and engagement in the visual and performing arts; politics; academic inquiry; science; foods; and interdisciplinary and innovative fields and topics. Some examples include health awareness, access, screening events; fitness and dance classes that promote physical activity; painting, cooking, foreign-language workshops; movie screenings; open mics and poetry slams; music events; and book clubs. The plant beds and furniture are designed to be movable and stackable and can accommodate large events of up to 300 people.
Other activities:
- On a monthly basis, we propose using the garden as a gallery space to raise awareness of diverse topics and visual arts, such as climate change impacts, a local artist's work, to promoting gender equality. Harvard community members and local artists interested in showcasing a topic or their works can submit short online proposals that will be evaluated by the activities board.
- Weekly the garden will host a farmer's market.
- There will be de-stress zone that will include outdoor lawn games such as corn-hole and giant jenga and a bin for board games.
- The garden will also promote active reading and the sharing of books by having an outdoor, weather resistant bookcase in which individuals can donate, swap, and return books.

Management: As the potential for activities within the space is exponential, we propose the creation of an activities board comprised of students, staff, faculty, and non-Harvard community members that will help to coordinate activities, events, and use of the space based on the community’s needs and interest on an annual basis. We also propose Harvard establish a part-time funded garden manager position to oversee the daily activities in the garden, work with the activities board on events, coordinate plant bed volunteers, and promote the use of the community garden.

Gardening: Community gardening has been shown to help improve one’s diet. Our design will increase the surface areas available to plant, by having plant beds that fold into each other as well as being moveable. Harvard faculty, students, and staff as well as community residents freely can sign-up, individually or as a group, to sponsor a soil plot for the year to grow their crops. We will provide soil, water sources, and funding to buy the initial seeds and seedlings of their choosing; and volunteers will be responsible for watering and management of their soil beds as needed.

To encourage sustainability and knowledge generation, the focus of the plants and vegetation in the garden will be on native species, medicinal plants, and food-generating plants. Each plant bed will include signs describing the plant species, its origins and common uses. Studies have shown that psychological benefits of a green space are positively correlated with the diversity of its plant life (2). The types and arrangement of the plants with maximize on pollination sources, need for water and natural lighting. Additionally, we'll use an integrated pest management system for any pest control, with a preference for natural pesticides such placing chrysanthemums flowers in each bed.

Website and Bulletin board for continual feedback: A website and an on-site community board will be set up to share information and events and even food recipes, as well as allow an avenue for feedback and suggestions. The garden manager will maintain the website and community board.

Teaching and studying: The garden can be both a site and source of teaching. The plant beds and furniture in the space are moveable, and in storage will be stackable chairs, audio, and PowerPoint equipment available for holding lectures, workshops, or other events in the space. Within the space will be a black board as well as 24-hour wireless connectivity and electric outlets.

Consistent with the living lab theme, the new garden design, with its incorporation of biophilic principles, sustainability, and health promotion, provide diverse educational topics for students of all ages. Education topics can range from plant biology and cycle, to aquaponics, medicinal plants, environmental stewardship; food and nutrition; recycling and composting; to studying health impacts of community gardens and climate change mitigation -- endless

The garden manager will outreach to local primary and secondary schools, colleges and universities, after school programs, museums, and local non-profits to encourage field trips to and use of the space for education or class projects. Studies have shown that earlier experiences in nature and with gardening increase positive environmental attitudes and value placed on local foods, and concern for stewardship and sustainability later in life (1).

References: