CARRCROFT ELEMENTARY SCHOOL
MINDFULNESS TRAIL

PEIYUAN YANG
UNIVERSITY OF DELAWARE
BSLA SENIOR CAPSTONE
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Today, many school-age children face a lot of challenges that come along with the anxiety of a progressively complex modern society. Children may suffer from stress, bullying at school, issues from home, and being overwhelmed by social media. According to Sheen and Dudley (2017), anxiety suffered by children may result in children finding it difficult to go to school. A study supported by the National Health Service (NHS) found that one out of eight children in England between the ages of five and 19 experienced one mental disorder during evaluations in 2017. According to a recent New York Times article, surveys show the number of mental disorders in five to 15-year-olds has increased from 9.7 percent in 1999 to 11.2 percent in 2017. (Magra, 2019).

The need for mindfulness training early in life starts to become increasingly important. Mindfulness is defined as an awareness that develops from intentional, nonjudgmental attention toward a current personal experience. I am interested in designing spaces where mindfulness is considered as part of the design process because I believe intentionally design outdoor spaces can benefit individuals who are in need of therapeutic services. Studies show that nature-based therapy, including therapeutic woodlots, enhances the effectiveness of the therapy treatments that patients receive (Hayes, 2004). Experts advise that various purposeful gardens should be designed to allow children to participate in different mindfulness activities, specifically quite space, active space, and engaging space. Mindfulness education helps a group understand the value of engaging in and reflecting on various activities.

Many school children don't have access to nature in their outdoor spaces. However, the site for my project, Carrcroft Elementary School in northern Wilmington, Delaware, is a 10.58-acre parcel of land with plenty of open space. The school, built in 1963, belongs to the Brandywine School District and serves students from kindergarten through 5th grade. The principle, Mark R Overly, has taken the idea of mindfulness seriously by making it an overall theme for the school. Mindfulness practices at the school include morning breathing activities broadcast in class or the hallway, yoga poses, and mindfulness eating habits encouraged in the cafeteria.

I am interested in expanding the school theme of mindfulness to the outdoor campus by creating a more functional mindfulness trail and a mindfulness courtyard outside of the newly built cafeteria. Fortunately, the school campus already has some significant elements to include in a mindfulness setting, including the woodlot with a large canopy, healthy dominant plants, a small stream, and mindfulness signs. There is also ample open spaces to design new features. The school is seeking to redesign the curriculum for the children to have access to nature during the school day. The focus of my project is to ensure that there is space in the middle of the fragmented forest where children are able to interact with nature to enhance mindfulness and to design a mindfulness courtyard.

OPPORTUNITY

In considering opportunities at Carrcroft Elementary, I develop this guiding questions:
- How might a school provide students with a variety of places to experience different levels of mindfulness activities? It is highly recommended for any size school with any level of outdoor space, as long as a designer provides different levels of areas as defined below.

FOUR OBJECTIVES OF THIS PROJECT

1. Design a quiet space for elementary school children to interact with nature.
2. Design an active space for students to encourage more engagement in the mindfulness and learning process.
3. Design an engaging space for students to participate in meaningful hands-on activities.
4. To provide opportunities for students and community members who use the site to earn about mindfulness concepts.
Carrcroft Elementary Mindfulness Trail - This location has a small woodlot (forest fragment), and they would like to design the space inside of the forest fragment for the children to have access to nature during the school day.
A forest is an excellent environment for one to achieve mindfulness. It is comprised of trees of different species with many different smells and is home to various bird species whose sounds will enhance the experience.
The courtyard is another proper site for the mindfulness practice considering it has a big open space between the main building and cafeteria of the school. Students and staff could also enjoy the outside view through the big cafeteria windows.

 Facing north, cafeteria  

 Existing door  

 Facing south  

 Facing west, cafeteria  

 Roof drainage  

 Air condition
SITE ANALYSIS

- **Pros**: PRIMARY ENTRANCE, MINDFULNESS TRAIL SIGN, INVASIVE SHRUBS ON EDGE, OPEN SPACE INSIDE WOODLOT, BENCH, EXISTING MINDFULNESS SIGN (1 OF 5), INVASIVE SHRUBS ON EDGE, PRIMARY EXIT (CONNECTING TO PLAYGROUND).

- **Cons**: COURTYARD OPEN SPACE, EXIT DOOR FROM KITCHEN, ROOF DRAINAGE PIPE, CAFETERIA EXIT DOOR, WAREHOUSE DOOR, AIR CONDITIONER, 1. ROOF DRAINAGE PIPE, 2. AIR CONDITIONER.

**PROS**
- Pros are represented by green circles.
- Pros include:
  - PRIMARY ENTRANCE
  - MINDFULNESS TRAIL SIGN
  - INVASIVE SHRUBS ON EDGE
  - OPEN SPACE INSIDE WOODLOT
  - BENCH
  - EXISTING MINDFULNESS SIGN (1 OF 5)
  - INVASIVE SHRUBS ON EDGE
  - PRIMARY EXIT (CONNECTING TO PLAYGROUND)

**CONS**
- Cons are represented by red circles.
- Cons include:
  - COURTYARD OPEN SPACE
  - EXIT DOOR FROM KITCHEN
  - ROOF DRAINAGE PIPE
  - CAFETERIA EXIT DOOR
  - WAREHOUSE DOOR
  - AIR CONDITIONER

**CONS CONS CONS**
MINDFULNESS TRAIL PROJECT ACTIVITY

An activity direction:
I provided students with image stickers of different design elements they can include along the mindfulness trail OR anywhere on campus including the courtyard. I also gave a campus map.

After reviewing the description of the images together, they broke into teams of five (5):
As a group they were told to:
1. Decide which of the elements they like BEST.
2. Select THREE stickers to show their favorite ideas.
3. Draw ONE more original idea on the blank sticker I provided.
4. Place all FOUR stickers on the map in the area where they want to locate the element.
5. What additional unique ideas do they have for other elements? Draw on their map and include words that describe the original ideas.

Attendants: 95 students from 5th grade.

EXAMPLE ACTIVITY PLAN

Unique ideas:
1. Treehouse
2. Meditation Yoga station in the treehouse
3. Pond with ducks, fish, frogs, and turtles
4. Log bench
5. Water fountain for people
6. Rose garden and birdhouse for courtyard
PECEDENT STUDY

A: RANDALL CHILDREN'S HOSPITAL, LEGACY EMANUEL
Innovative Practices:
1. Including several semiprivate niches, like an area with rocks children can climb on.
2. Many details that attract children's attention, like woodland sculpture.
3. Providing places where the therapist can carry out their sessions.

B: A THERAPEUTIC GARDEN FOR THE PUGET SOUND VETERAN'S AFFAIRS HOSPITAL
1. The furniture will be placed in the garden to create a physical and visual appeal within the garden.
2. Movable chairs and tables which will enable children to be able to socialize with each other actively.
3. A green wall with aromatic herbs will allow patients to have a place where they can play on by trying to reach up and touch it.

C. A COMMUNITY RESTORATIVE GARDEN
Innovative Practices:
1. Addressing entrenched social understandings and increasing access to nature.
2. Plants selected for fragrance and edibility and for children to explore the smells and textures.
3. Adding natural elements, like tree trunks with climbing dowels, wood

D. GREENFIELD PARK - GREENFIELD, CALIFORNIA
Innovative Practices:
1. The park includes many custom play features that reflect the geology, hydrology.
2. Park features include an amphitheater, water diversion, playgrounds and, a climbing wall.
3. The natural park's vegetation, designed to reflect the chaparral and coastal scrub biomes of the area.
SITE ANALYSIS

Sun: The summer sun is higher than the winter sun, which makes different shadows in the woodlot. Different shadow patterns could be used to inspire students to observe and learn more about how the sun affects their life. In the courtyard, the sun comes from the eastern side, and the main building of the school block sunlight so that it is shaded in the morning. However, it will be in full sun in the afternoon because the sun comes from the western side, and the build of the cafeteria is not high enough to stop the sunlight.

Wind: Winter wind is from the top left. In the top middle of the site, there is a big open field. Because it is open and next to the neighboring properties, it can not stop the winter wind and maybe not safe. I will think about fences and vegetations in my design.
SITE ANALYSIS: TOPOGRAPHY AND WATER

Elevation changes from 256 to 226 feet, and stormwater runs into the river on the eastern side of the map, which is elevation 212 feet. According to USGS StreamStats, there are 0.75 square miles that drain into the same spot of the river. Since elevation height decrease from left to right, it causes serious standing water problem after or during heavy rain, which is pointed out by blue circles in the graph below. Standing water are located next to the playground, the edge of the woodlot, the edge of the root system, and the northeast side of the trail pathway. It is hard to participate in those areas once it rains, especially the north-east side of the trail pathway in the woodlot. Boardwalks will be considered in the design.
SITE ANALYSIS: PLANT COMMUNITY

**Plant Community:** Northern Piedmont Mesic Oak-Beech Forest

**Occurs:** on mesic substrates

**Characterized by:** not any one domainated species, but a large heterogeneous mixture

**Associated soil type:** Well drained, silt loam (0-44 inches)

Landscape position: Flat woods that are mesic being half dry and half in the lower elevation on the eastern side.

This forest is the most common type in all of the Piedmont watersheds in Delaware. The Mesic Rich Forest is generally dominated by tuliptree and has a richer herbaceous layer. It may include species as below:

- **Canopy trees:** Tuliptree (Liriodendron tulipifera) and American beech (Fagus grandifolia) are frequent in the canopy and are associated by white oak (Quercus alba), northern red oak (Quercus rubra), black oak (Quercus velutina) and hickory (Carya spp.).
- **Understory tree:** American hornbeam (Carpinus caroliniana), sweet birch (Betula lenta), red maple (Acer rubrum).
- **Herbaceous plants:** Christmas fern (Polystichum acrostichoides), white wood aster (Eurybia divaricata). Solomon's seal (Polygonatum biflorum)
- **Invasive shrub:** Multiflora rose
- **Evergreen shrub:** Holly and Rhododendron.

Since it is not safe to have woodpiles and an open field between school and neighborhoods, I will think about adding more holly or Rhododendron in my design.
SITE ANALYSIS: ZONING DIAGRAM

Building:
The site is situated in an area with a building running north-south across the first third of the property. The building looks like an overlay of two rectangular boxes. There is a new addition to the building on the left, which is a new cafeteria.

Pavement and Green
This site leaves the back of the building with approximately two-thirds of the land for outdoor activities. It is separated by pavement area and green area. Pavement area takes 40 percent and green area takes 60 percent.

Tree canopy:
The green area is divided by 50 percent lawns and fragment forest. Lawns give a big open space for schools to hold various activities, like sports. Forest provides a large amount of forest canopy, which is a place to engage in and explore the pleasure of nature.
ACTIVITY ANALYSIS

HOW OFTEN IS WOODLOT USED?
Not very often, kindergarten (age 5) use is more than older students (1th-5th grade age 7-11).
5th grade not ok to stay alone in the wood
Need open view

HOW IS IT USED?
Kindergarten: science
Elementary: Cycle from the entrance to exit, which is closer to the school building.

HOW DO PEOPLE WALK THROUGH THE SITE?
Enterance and exit, do not walk through the whole site.

WHICH DOOR DO THEY COME IN AND OUT?
The door next to swing playground

HOW DO THE CARS DROP OFF AND PICK UP STUDENTS?
Long vehicle line away happens because all age students need to be picked up at the same time and same location. School buses drop off at the main entrance of the building.
According to research described in *Therapeutic Landscapes*, (Marcus & Sachs, 2014) the following three areas are important for creating a mindfulness trail.

**SAFTY:**
The mindfulness trail will include a safe space within the trees that provide canopy. The open spaces within the area will be made safe to offer refuge for those seeking to realize mindfulness.

**VARIOUS PURPOSEFUL SPACE:**
The energetic space will comprise features such as climbing rocks and sand that will encourage those visiting it to play. Space will enable children to wander around and explore the area.

**NATURAL WORK MINDFULNESS:**
The natural mindfulness space will include an area where seeds are sown and watered. Additionally, there will be a birdhouse where one can feed birds while relaxing in the area. The natural mindfulness space will have enough space for people to work with hands, move and also be able to get tools to use while in the area with ease.
SITE ANALYSIS: VEGETATION

VARIOUS PURPOSEFUL SPACE
1. Rain garden: solve slope land and stormwater issues
2. Tree house: a mindfulness space with two low floors, safe space with walls arounded to relax and meditate, or read, learn.
3. Vegetable garden and picnic table: close to kindergarten building which offers more outside learning spaces.

1. Wood deck: a space for students to gather together to learn in an energetic space.
2. Playground: an energetic space to help students for a better concentration and patience.

1. Garden for staff: a private space for staff to gather
# Plant Schedule

## Concept Plant Schedule

### Meadow Garden
- **Size:** 9,794 sf
- **Plants:**
  - Allium cernuum / Nodding Wild Onion
  - Aquilegia canadensis / Canadian Columbine
  - Baptisia australis / Blue Wild Indigo
  - Bouteloua curtipendula / Side Oats Grama
  - Bouteloua gracilis `Blonde Ambition` / Blonde Ambition Blue Grama
  - Carex eburnea / Ebony Sedge
  - Carex flaccasperma / Blue Wood Sedge
  - Carex platyphylla / Broadleaf Sedge
  - Carex appalachica Appalachian Sedge
  - Asclepias purpurascens Purple Milkweed
  - Asclepias verticillata Whorled Milkweed
  - Aster laevis `Bluebird` Bluebird Aster
  - Callirhoe involucrata Purple Poppymallow
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SECTIONS

Ephemeral stream (wooden walkway) before the rain

Ephemeral stream before rain

Ephemeral stream (wooden walkway) after rain

Ephemeral stream after rain

ACTIVITY ANALYSIS

Tree house

Bicycle path

Playground

Meadow garden

Ephemeral stream

Vegetable garden
REFERENCES


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