
GROWOPOLIS
2017
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Anhalt University of Applied Sciences

GROWOPOLIS
–an edible oasis–

Master thesis by Anna Clark
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Master of Arts in Integrated Design
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Me as a child, in New England, in the backyard near where the raspberries and rhubarb grew.

Preface

Personal Motivation

My connection to this project is through nature, health, and food. I appreciate the importance of children and their imagination and creativity, and would like for them to be enjoying the importance of gardening while learning about it. Even more, I hope the parent learns and becomes involved in the topic as a response to the child.

As a child growing up in New England, I was fortunate enough to have a backyard with some edible plants like raspberries and rhubarb. I remember picking plants and using them as part of my imaginary play. In the fall I would go apple picking with my family, trying to fill the bags as full as I could and climbing the trees to the tallest heights. Afterwards we would make delicious baked goods. I was really lucky in this regard to have this special connection with nature.

My first experience and exposure to gardening began when I decided to try it at my College in Boston, MA. While collaborating with other students, we created a garden bed in the center of the schools courtyard, which I hope is still thriving and being cared for by students to this day. It was significant to me because it fueled my passion for plants, and proved the potential for gardening in the city. Soon after I became involved in several urban farming activities.

Since moving to Germany my gardening activity has dwindled, but my passion for the topic still exists. Since I move from space to space on a regular basis, I have had to resort to container gardening. Having plants in my living space helps to improve my mood, the activity of caring for them makes me calm, and having them around during the winter time makes me happier. I am constantly in awe of the plants and how they develop. I feel proud and a sense of accomplishment when I can make meals from items in my container garden. Although I may have some experience with gardening, I am certainly no expert. I enjoy continually messing up and learning. I would like to be more involved, but feel constrained by time, space, and money.

Many friends and colleagues have expressed interest, but also face similar constraints. Another reason I would like to work with parents is because a few of my friends now have children, and as they are quite young children, I wonder how their parents might be participating in teaching them about the natural world. Since a few my friends have such young children, I wonder as well what kind of knowledge I can share with them that they might enjoy and be able to use later on in life. I am motivated as a result of these expressions, because I think gardening may help and benefit others as it has myself. It has given me a better understanding of nature and how things work together.

My experience has fueled my passion and involvement regarding gardening, and made me want to keep learning more about plants, nature, and learning, which is why I chose to work with container gardening in compact spaces for families, so that more people have access to gardening and a taste of this activity that I enjoy so much.

Photo Credit: Chi Tranter via Flickr

Introduction

We are gradually loosing touch with nature. There is a small but significant revolution on the rise for urban farming, and container gardening within city settings. Global warming has caused people to learn and adapt by increasing green spaces. A piece of the concept of family and community farming is being re-imagined and reintroduced in various ways. It is important for children to start learning about nature at a young age. The disconnect from nature is especially prevalent in cities where normally there is a lack of green space. Even in suburbs, finding unaffected nature is becoming more and more difficult. In addition, parents should feel a responsibility to reinvigorate a child's interest and understanding of the natural world, and in turn, doing the same for themselves. I therefore decided to pursue the very relevant topic of food and nature education for young children, with a goal of reintroducing the observation, creative interest, and independent cultivation of edible plants as a family and community. Adding greenery to the city, whether inviting it into the home or nearby, has a multitude of beneficial effects that create positive change.

DESIGN QUESTION:

How might families with young children living in cities or suburbs begin gardening as a fun and educational activity?

History

Up until the Industrial Revolution in the early 1900's, farms were self sufficient, and they worked in closed loops. These farms used mixed farming practices, and supplied different varieties. (Aguilar, "Voices of Transition") Farmers had to closely observe how the land and plants responded together, and because of this we know a lot about all the different attributes that create a healthy and happy plant. Unfortunately, the industrial revolution focused less on the plants, and more on creating higher yields for more people, and as a result, it has caused a lot of damage over time. Monocultures are creating erosion because of the exposure of the top soil. Pesticides are poisoning the 'pests' that feed on them, and potentially decreasing the population of bees, which pollinate plants. The way food has evolved and industrialized it is hard to imagine how it was done differently, and we can not go back to how food used to be grown, but we can adopt some lessons and practices on how food can be grown as a community or a family on a small scale. After all, it was only "less than a century ago, people relied on small-scale farms and gardens to grow the food they needed to feed their families. It was commonplace for each household to have a veggie plot on their land." (Isbell, 2013)

"Less than a century ago, people relied on small-scale farms and gardens to grow the food they needed to feed their families."

Even during the industrial revolution, there were some periods where gardening returned to popularity out of necessity. During WWI and WWII, many men had to fight in the war, which left women to stay home and were urged to create 'Victory Gardens.' In the city of Toronto, Canada, they even took initiative in inviting garden experts into schools in order to get children and families interested in gardening. This is perhaps

where the stereotype of gardening being a feminine activity was rooted, because it was typically women at home supplying food for their family and soldiers. After the wars came to an end, the necessity was no longer there, and the gardens fell into the background.

In the 1940's there was another alternative green revolution started by the agronomist, Sir Albert Howard. He was sent to India to teach the natives about Western farming, but instead discovered that the methods they were already using maintained soil health, and used innovative composting systems. This led to the idea of modern composting and the beginning of organic agriculture as a movement. (McDonough and Braungart, 2013, p. 128) Which brings us to today, where we are seeing a new revolution, with modern farmers and urban gardens fitting into our present context.

Super Hero Victory Garden by paul.malon, via Flickr

Current Context

There are many trends at the moment revolving around sustainable food production, and environmental protection. "Since food is at the root of so many of our problems, from health to environmental sustainability, it must also be the source of the solutions to these problems." (Gladek, 2012, p. 78) Although this project does not focus on all of these trends, the potential is worth mentioning to forecast ways it may be relevant in the future.

DEFINITIONS

These trends and technologies are relevant in todays context, because they are gaining popularity, and this visibility is why the subject is getting a lot of attention and increasing awareness.

Biodiversity

This relates to the historical context, because earlier civilizations consumed about 1500 various species, while today we are only provided about 9 of these on average. Diversity has positive benefits for farmers such as ecological control and higher land productivity, yet farmers still tend to prefer monocultures. When crops are less diverse this makes them more susceptible to disease and pests. (Keep, 2009) When diverse plants are planted together it can have a lot of positive impact on how they thrive, as well as balancing the ecosystem around them. This has led to creating more biodynamic farms. This approach was first founded by Rudolf Steiner, who was a prominent scientist and philosopher in the early 1900's. He was the first to warn people

against the effects of synthetic fertilizer, which were just beginning to be prominent. He suggested a closed loop, self sustaining system, which later supported the idea of CSA's (community supported agriculture). (Moore, 1997) Fortunately some farmers have adopted biodynamic practices and produce high quality organic products. For example, in Cuba, many farmers have adopted biodynamic practices for their farmland. This shows us that in some places diversity can still thrive, but in order to make it more widespread we need to try a taste of something different.

RELATED:
companion plants, alternative foods, permaculture

Locavore

According to the dictionary, a locavore is defined as a person who makes an effort to eat food that is grown, raised, or produced locally, usually within 100 miles of home. (dictionary.com, 2017)This means they make an effort to eat locally grown and seasonal foods, which supports their local community, or they are engaged in their own activities.

RELATED:
self-sufficiency, ethical consumption

Food Waste

Lots of "ugly" produce is disposed of before it can reach the supermarket. This means lots of resources are being used for food that will never be used, and the waste is being sent to landfills. People should learn to accept food that may be different from their expectations, and farmers or gardeners should find ways to compost and reuse food scraps. This can also be done as well for people at home who have expired produce, they can turn it into compost and reuse it as fertilizer.

RELATED:
leftovers, landfills, food education

Ethical Consumption

This term means that people are becoming more aware of the products they are purchasing and how it is produced. Some ways to be aware of whether or not products are ethical is finding where they were produced, and how it was made. Some people look to buy local or regional products because it means the food is being transported shorter distances, and it will most likely be in season. If it is local it does not mean it is organic, and as well if it is organic is does not mean it is local, but products can be organic and local. Organic means that the produce was created without the use of pesticides or chemicals. These products are usually compared with others to be higher in price, but they are usually more nutritious and have a higher quality. As well, the assumption that the price is higher is not accurate, because local produce has to travel less, and it will be fresher. Organic produce as well usually has higher nutritional benefits, so one organic apple might have as much nutritional value as two conventionally grown apples for example. This choice is becoming more and more in demand, and comes from individual choices and has become more popular as a result.

RELATED:
Food labeling, Organic, Locavore

Urban Countrification

This term refers to rural practices being popularized in urban settings. For example subtle practices as small acts of political protest like guerrilla gardening, or seed bombs. This act has expanded further into Urban Farming, using alternative and unexpected areas for agriculture such as rooftops, in order to create some form of self-sufficiency. These forms and practices can even be introduced into the home. The term also refers to a style – being more rustic in appearance, and somewhat nostalgic. It rejects cosmopolitan norms of being clean and perfect, and embraces the introduction of the countryside within a city setting. (Trend One, 2016)

RELATED:
DIY, New Living Concepts, Eco City

COMMENTS

These trends all relate to my project in various ways. People can be open to creating systems with plants that work well together in the environment, have access to food nearby, accept strange looking produce, consider ways to be more conscious of food purchases for children, and open to integrating larger garden spaces into their living areas.

Future

In a future world, the soil could all be eroded and ruined by chemicals, and we are left to either have large hydroponic industrial operational systems, and because of the inflated prices, and new type of campaign for self-sufficient gardens. “Society might be delightfully surprised. The next green revolution might… come from intensive local growing… optimized water use, improved permaculture to replace chemical requirements, and multistory greenhouses.” (McDonough and Braungart, 2013, p. 140) Let’s hope the soil can be saved or rejuvenated. Even in the 1960’s, a scientist named James Lovelock proposed his Gaia hypothesis, which describes “the Earth as behaving like a super-organism, its soil, atmosphere, and oceans composing a circulatory system regulated by its resident flora and fauna. He now fears that the living planet is suffering a high fever, and that we are the virus.” (Weisman, 2007, pg. 213) In order to heal this virus, people need to make changes. In the near future, parents will take initiative with their children in teaching them how to grow food in container gardens in their own homes, which are decreasing in size because of overpopulation. They can garden efficiently in compact spaces. Those children can go on to make their own gardens and find even more efficient methods. This act begins with a set of fun lessons and activities which they will carry with them into the future of agriculture.

Photo credit: slcl events via Flickr

DEFINITIONS

The following terms are defined or explained to get a better understanding of the people involved, and ideology applied. Knowing about these aspects are important, and relevant to the integration in the project.

Pre-operational Children

This term refers to Jean Piaget's second stage of cognitive development, for ages 2 - 7. According to Piaget, children in this stage respond to and understand symbolism such as words and imagery. (McLeod, 2015) During this stage they are highly imaginative, and it is reflected in their play. They are able to create characters and pretend scenarios. However, during this phase they are 'egocentric', a term meaning that they have difficulty relating to another persons point of view, or can not understand that others may have differing thoughts and feelings to what their own are. Also in this stage they struggle with 'conservation', meaning that objects can look different, but still have the equal properties. Another characteristic at this age is 'animism', they can believe that everything has some sort of consciousness or feelings. This characteristic can be very helpful in relation to getting to know more about plants, and wanting to know more about their character, personality or story.

Kindergarden

The idea of creating a garden for children, and a garden of children, began with Friedrich Froebel in the mid 1800's. He thought young children needed a place to observe and take care of plants, in order to understand the natural world. He also believed in imagination, expression, and play that would stimulate learning activities. He developed several 'gifts and occupations', now called Froebel gifts, that were intended to teach children about objects and nature (Smith, 1997). One of the core concepts of kindergarden that survives to this day is nurturing the playful imagination of young individuals, but what has become lost and diluted is the important element of being connected to and discovering nature through gardening.

"Children are like tiny flowers; they are varied and need care, but each is beautiful alone and glorious when seen in the community of peers."
– Friedrich Fröbel

Parents Role

Teachers are expected to teach children in an educational setting, but before the age of 7 they do not begin such formal lessons. During this time, the children spend a lot of time with their parents – doing playful imaginative activities, but they can also begin engaging learning activities. It is the parents responsibility and choice to participate with the child in these activities. It is also important for them to learn and discover the natural world. In 2010, Chef Jamie Oliver, asked a class of first graders with children age 6 - 7 various questions on identifying vegetables. The class was not able to name a single one of the vegetables which included eggplant, tomatoes, cauliflower and tomatoes. Perhaps this was an isolated study, but a poll taken by the BBC in the UK revealed that 10% of children do not know that potatoes grow underground (Burns, 2013). This indicates that children are not being exposed to the natural world, and especially the process of growing food in order to understand where it comes from. It also indicates that children have not had contact with fresh grown produce, and that their parents aren't having the children participate in meal preparation, or using fresh ingredients. This also shows that it is equally important for parents to learn about produce and where it comes from for their own interest, and to share with their children. The responsibility should not be solely on teachers. Parents need to help and take interest. As stated by Michael Pollen in Food Rules, "Eat foods made from ingredients that you can picture in their raw state or growing in nature." (Pollen, 2009, p.31) However, if you are unable to picture plants in the raw state, you can not follow this rule. Especially if the children are picky eaters, Jamie Oliver's food revolution states, "If kids are involved in growing and cooking food, then they're far more likely to eat it." (Oliver, 2016). Many children who are exposed to plants and gardening at a young age are more likely to eat an increased amount of fruits and vegetables, and some studies even show that they do better in school. So for healthy and smart children, gardening seems to be an important activity.

Photo Credit: Eric Dupuis via Flickr

Clip from Jamie Oliver Ted Talk

Photo by: lermaniac via Flickr

Nature Education

In addition to learning about the source of where the food comes from, it is also important to understand how it becomes food, and the connection to everything else, in order to have some empathy and understanding for the world as a whole. People are more and more diluted by technology, and have less access to nature, especially those living in city and suburban settings. In Germany, there are some specialized Kindergarden's called 'Waldkindergarten,' where children spend their entire day outside in the woods surrounded by nature. They are able to explore, play, and learn from the natural settings. This has been criticized by some parents because they perceive it as dangerous, the children being too young, and irresponsible. On the contrary, it teaches the children to be more independent and less afraid of nature. In my undergraduate studies, a friend of mine shared an experience she had going on a field trip with her biology class. One of the students in the class, at age 19, was experiencing the forest for the first time in their life. From what I can recall, they were anxious and afraid of the natural surroundings. When children are exposed to nature and the elements at a younger age, it is easier for them to relate to it and be more empathetic towards the environment.

Food Education

Many children believe the source of food originates from the grocery store. They aren't aware of how it is further processed. They are also unaware of the effects that food may have on them. Nutritional education should be easier to access for parents and children. Especially if you live in the city, or a condensed suburb, it can be very difficult to find sources where food is grown. Research by the 'Kitchen Garden Foundation' showed that one in five parents were concerned that their children prefer processed foods instead of fresh or healthy foods (Gamble, 2014). It is in the interest of the parents, and the children, to begin the process of food education at a young age.

Transition Design

Sometimes solutions can cause problems, but in transition design, it is always prepared to undergo change. It is intended to create systems with a closed loop, which can be continually adapted or improved upon. Transition Design seeks ways to create positive social and environmental change. It considers global problems, and local place-based lifestyles. (Irwin, 2009, p. 231) Transition Design also encourages an openness to change. There should be a willingness or curiosity to try new everyday practices. (Tonkinwise, 2015, p. 91) Learning can be challenging and takes time, so Transition Designers must continue learning and adapting to new practices. Throughout the research I have continuously tried to keep this design concept relevant and applicable in the project.

Photo credit: FotoMediamatic
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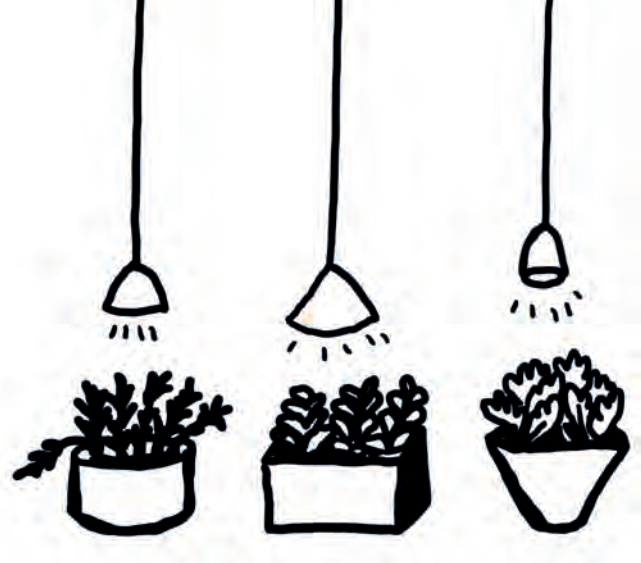
GROWING METHODS

These various techniques were aspects that I tried to get a deep understanding of in order to consider how they might possibly be incorporated into the project, to decipher if these could be plausible in terms of cost and effort for the target audience. Several options were ruled out, but aspects of them can certainly be considered in advanced levels. Learning about these different methods was important to understand the full potential and possibilities for home gardening.



Indoors

These operations tend to rely heavily on mechanical systems such as watering and lighting. Although the production costs are high, when these systems are carefully regulated it can create successful yields. Although it is costly to set up, there are many ways to make it energy efficient, and even reuse water. Countries that do not have as much access to growing plots, or have difficulty growing, such as the United Emirates and Iceland, are investing in these methods. (Ladner, 2011, p. 67) Plants growing indoors can grow and be harvested year round. Indoors there is less exposure to weather and pests, so there are less crop failures. As another result of less pests, it is easier to produce organically grown crops, without using chemicals.

Hydroponics

This system replaces soil with a constant flow of fertilized water full of nutrients. This can even be done small scale, for example window farms, you can simply create self watering systems, in which the water is re-used. Since it is indoors it means that food can be produced year round.

BENEFIT: *save water*

Aquaponics

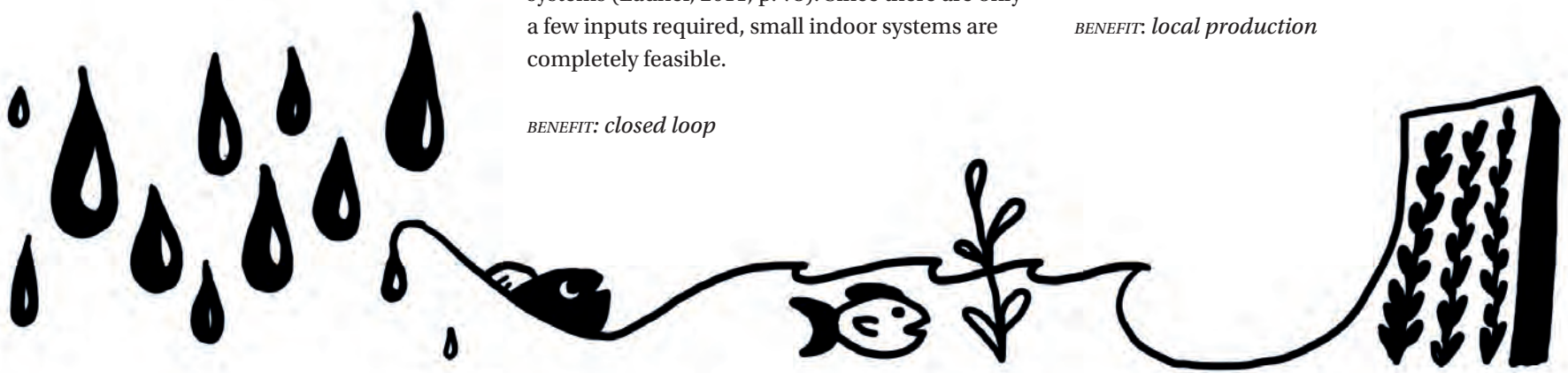
This method is a combination of aquaculture and hydroponics. Aquaculture is a term for fish farming, and hydroponics concerns growing plants in water. This operation is a small scale closed loop system, reflecting processes in nature. The fish waste is used as the fertilizer for the plants, and the water is filtered by the plants. The cleaned water is then used to water the plants, and the cycle continues. These plants require 80-90% less water than other systems (Ladner, 2011, p. 73). Since there are only a few inputs required, small indoor systems are completely feasible.

BENEFIT: *closed loop*

Urban Farm

These farms are usually small operations existing in city settings by community initiatives, or sometimes larger scale operations, even growing on rooftops. It shows that gardening and farming can still exist in city settings, even with the lack of space, there can be a place to grow. Growing in the city, means that the produce does not have to be transported as far to be delivered. Urban farms creates and offers local produce to city dwellers.

BENEFIT: *local production*



Indoors and Outdoors

These systems can be used and applied both indoors and outdoors. They rely more often on natural sunlight and frequent watering. These systems are often compact and intended to save space.

Vertical Farm

These systems are usually indoor operations, with plants growing upwards rather than sprawled out. However, they can also be done outside on large scale walls. It can be appealing because of the amount of space that is saved. Usually the systems can be intricate because the water has to be filtered through all the levels, and returning to the bottom of the building with the heaviest point. As a small operation it is very efficient to save space, but usually means the containers are smaller, which means lower yields. This can be done at home as well using a wall or trellis.

BENEFIT: ***save space***

Container Farming

This kind of method means the plants are mobile, and can be easily moved if necessary, either because the space is no longer available, or if the conditions are not ideal. The containers can be small or large and adapted for the plant. Although many materials used for containers are not ideal because the earth dries faster, and the plant can become pot bound when not moved to larger containers, there are other more ideal materials. Containers are an excellent solution for home gardeners who have less space.

BENEFIT: ***mobility***

COMMENTS

These methods were all considered on how they can be applied on smaller and more affordable scales. They each have amazing potential, but some require more time and space to set up. I chose to focus on urban farming, and especially container gardens while moving forward with the project, because I find fabric containers to have amazing qualities for home gardening and plant health. Fabric containers are not as visible as they should be because of all the amazing benefits, such as drainage, strength, and adaptability. Exploring these options inspired different aspects of the project, and helped to define the outcome.

Target Group

Working with young children, age 2-7 is an important focus when it comes to gardening, because they are open to trying different things and have a vast imagination. In this case I find the age interesting because they relate to objects and things differently – perceiving them to also have thoughts and emotions, like other living beings. Since plants actually are other living beings, it is important to engage in activities with them through experimentation and storytelling. As well, it gives the children a responsibility, and a chance to engage in creating something, then seeing how what they helped to cultivate can be used for creative mediums or food. In addition, it may give them a sense of accomplishment in helping to contribute to the family by completing small but important tasks such as watering or harvesting. By creating and harvesting the food, it places an importance to the child, and makes it more appetizing to them. It teaches them from the beginning of their lives the importance of natural life forms, and what we can do with them.

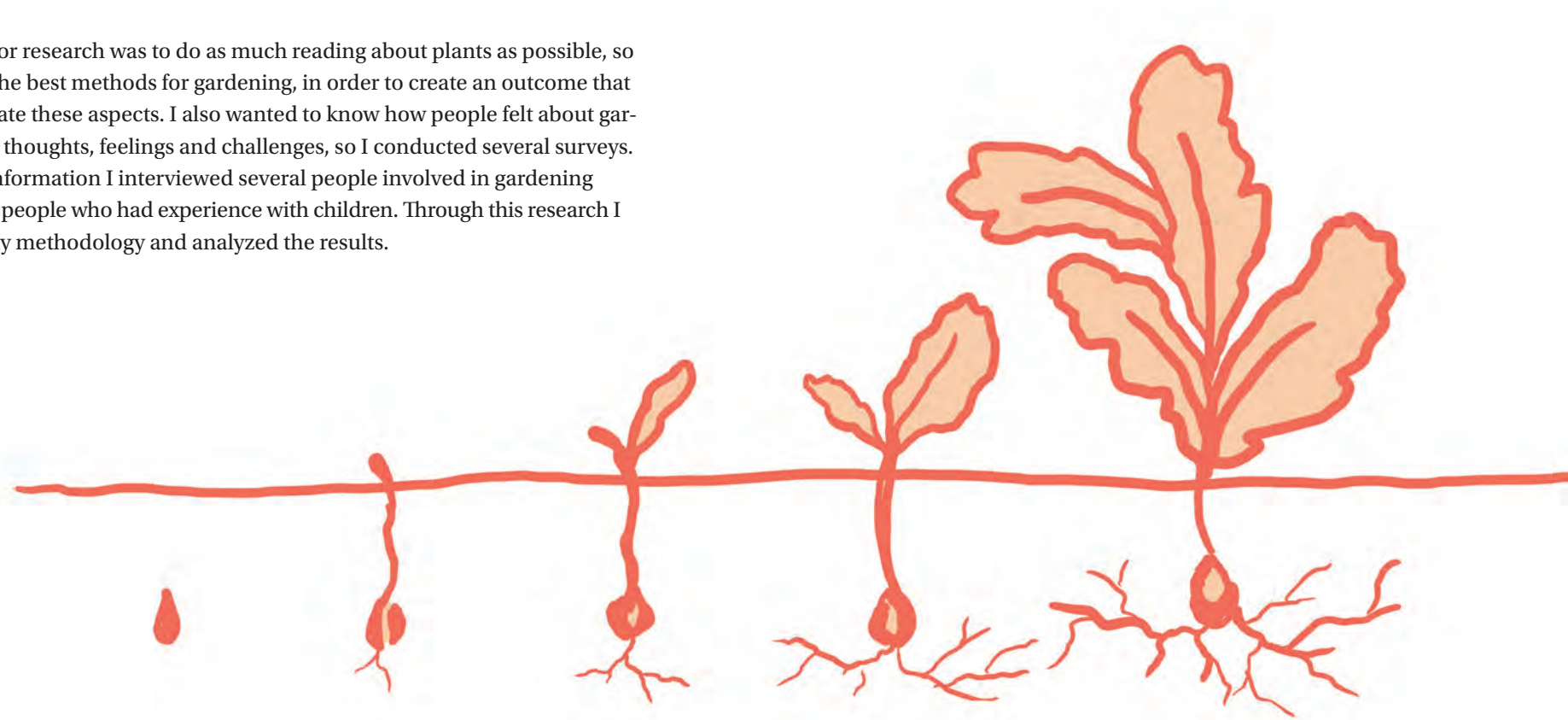
A very important aspect as well is the engagement of the parents. They are caring for their kids, and for this reason it may also be why they want to begin in the activity. Since they might be beginners as well, it is important to keep the parents engaged and keep the process clear for them. I am interested in the parents and children as a whole to influence and learn from each other new things about nature through doing gardening activities. I am also considering lower and middle income as a demographic, because they are not able to afford more costly materials, and may have less space available in their home. Middle and lower income families may also struggle more with finding healthy and fresh food nearby. Many areas with this demographic have less access to healthy food. In such areas, food deserts exist, this refers to any area that has limited access to nutritious foods. This shows that they do not have as much access to healthy food, and must go to further lengths to try and find ways to incorporate this into their diet. Rather than traveling

Photo credit: Chris Parfitt via Flickr

further distances to get this access, I suggest they begin to provide alternatives in their home with the help and interest of their young children. In addition I would like to focus on the mother and father being active participants as well, and not focusing on the gender of the child. Since gardening is generally perceived as a more feminine act, I would like to try to find ways to make it appealing to both parents, and usually children are unaware of these gender stereotypes unless enforced by the parents. Gardening is a responsibility and activity that is important and can be enjoyed by everyone. Food needs to be visible in cities and suburbs. Starting in homes, and hopefully spreading out. Children can be proud of their accomplishment and share it with others. This model can use new technology such as fabric containers, and open shared resources, as well as older practices and knowledge of plants and biodynamic practices. What families are eating has to grow somewhere, so why not have some of it their very own home. Nearby it will be even more nutritious, fresher, taste better and is more cost efficient. “Gardens are great fun, they provide the freshest produce, and gardening as a child has lasting effects.” (Nosowitz, 2016)

Research

My strategy for research was to do as much reading about plants as possible, so I could find the best methods for gardening, in order to create an outcome that would integrate these aspects. I also wanted to know how people felt about gardening, their thoughts, feelings and challenges, so I conducted several surveys. For further information I interviewed several people involved in gardening projects, and people who had experience with children. Through this research I developed my methodology and analyzed the results.



Plants

Since I knew plants were to be a key part of the project I thoroughly researched all aspects of caring for them, including all the different varieties, and their preferences.

Container Gardening

Container Farming is an excellent option for people who want to grow food at home. No matter the amount you want to grow, container gardening supplies you with all kinds of options. Although some containers are better than others, they are all sufficient. Of course planting directly into the ground is the best option, because then plants are not constrained by growth, but if plants are put in containers large enough, they will flourish to their largest potential. For this reason, there are certain plants that work better in containers that do not require as much earth to grow, there are even dwarf varieties of several vegetables, that look the same, they just grow a bit smaller.

The material of the container is important as well – plastic pots absorb a lot of heat from sunlight, and can dry out the soil quickly. However they have the benefit of retaining water for a long time, they are cost efficient, and are relatively light to move. Ceramic pots have similar problems, and are even heavier to move, and significantly more expensive. Both plastic and ceramic containers have thick walls, which means when a plant is outgrowing its container its roots hit the edge of the surface. Rather than extending outwards, they continue to grow further around the container creating an effect called circling. This can strangle the roots, block the drainage holes, and make it pot bound, meaning it will die unless moved to a larger container where it can breathe. A solution to this effect is using natural paper pots, or an even sturdier more breathable solution – fabric. Fabric containers are beneficial because they are flexible, light, easy to move, easy to manipulate in various custom forms, they take up little space, and require very little storage when unused. Despite appearances, they are quite durable. The best benefit though, is the benefit for the plants. Unlike planters with hard structured exteriors, fabric exposes the soil to the air, and therefore creates an effect on the roots called ‘air pruning’ when they have reached the edge of the container. The exposure to the air stunts the growth of the root, and rather than circling around, the end stops, and the length of the root continues growing outward along the stem. Fabric containers are also very cost efficient, and can be produced naturally. “Container gardening is not a new concept, but the types of containers that offer the ability to produce unprecedented amounts of food are indeed revolutionary.” (Isbell, 2013)

In order to motivate people to introduce edible plants into their homes, they need large containers which are easy to move, cheap to purchase, can produce flourishing plants, and are aesthetically pleasing – fabric containers fit this criteria. Also, for the success of your plants you are able to move them easily to see if they do better in different places. You can place them so they are somewhere nearby, usually when you share a living are with your plants, you are more likely to pay more attention to them, or notice if they have any ailments.

Some people may be skeptical of the practicality and success of growing edible gardens in container within small spaces. However there are several cases that prove this assumption wrong. A New York City dweller, Mark Lieberman, began an organic vegetable garden on his fire escape. He had no prior experience, and began with self watering containers, and has successfully grown a variety of vegetables. (Dailey, 2012) Mark Ridsdill-Smith uses his 54 square foot balcony to grow vegetables, in one season he was able to harvest 145 pounds of produce, including tomatoes, salad, beans, zucchini, and herbs. (Ladner, 2011 p. 93) That is quite impressive for such a small space, and goes to show that container gardening in apartment settings can have successful and high yields. These container growers are doing a favor to the planet as well, “for every kilogram of vegetables you grow yourself, you’re reducing greenhouse gas emissions by 2 kilograms.” (Cleveland, 2017)

A flourishing NYC balcony garden.
Photo credit Mike Lieberman via Inhabitat

"For every kilogram of vegetables you grow yourself, you’re reducing greenhouse gas emissions by 2 kilograms."

Container gardening is also a nice way for children to be part of the process. With the parents busy schedule, they may not always be able to go to the park or outdoors every day. It is a nice way to bring nature home, and have them observe the progress on a daily basis. The container can also be on the floor level, or easily accessed, so that the children can work with the plants independently if they choose to. It is also beneficial for parents because they are easier to keep track of the plants at home. Container gardening enables parents and children to “reconnect with their produce and enable them to grow it themselves in an easy, fun, and sustainable way.” (Ian Hsieh, 2017)

PLANT CARE

In order to take care of plants, and garden at home, there are quite a few things that are good to know, especially for edible plants in containers. If you want have your plant flourish, you need to know what your plant favors and what will work best to create optimum conditions. Caring for plants has many factors that can be overwhelming to intake all at once, but if you look at each step individually, it is manageable. Generally, taking care of container plants is easier because they don't get as many weeds, diseased soil can be replaced, and water is close by and accessible. If you can learn just a few of these lessons about plants, you can have a thriving container garden.

Seeds

Plants can grow practically anywhere, given the right conditions. It is important to plant seeds based on the time of year, and to give seeds the allotted space they need to grow into large hardy plants. Knowing the type of seed and its needs beforehand will always ensure its best potential. Finding affordable seedlings is pretty easy, in some areas there are even seed swap groups. It is also a fun social activity to do with others, you can share or trade whatever seeds you have, and compare the progress.

Plant Varieties

For containers you may want to grow plants that are available for longer periods and multiple harvests like squash, tomatoes, cucumbers, peppers, or herbs. You can harvest these plants many times over the course of the season. These plants also have vertical needs and like to climb upwards. You can put anything into the container that they can grab on to and climb upwards on.

Dwarf Plants

These plants are amazing for small spaces because you can still grow vegetables like tomatoes and peppers – they just come in miniature forms, and require less space to grow. You are unlikely to be able to grow food for every single meal, but using food from your home garden for side dishes on a regular basis is an amazing feeling. There are many plants that come in smaller sizes, and as an added bonus, they mature quicker than their larger counterparts. You can also look for 'compact' or 'bush' varieties that work as well. Some of these particular varieties have fun and interesting names!

DWARF VARIETIES: *Thorogreen Beans, Gladiator Beets, Modern Dwarf Cabbage, Short n' Sweet Cantaloupe, Bunny Bite Carrots, Bush Whopper Cucumber, Tom Thumb Lettuce, Quicksilver Onions, Mini-Jack Pumpkins, Droplet Tomatoes, Family Fun Watermelon.*

CONTAINER VARIETIES: *Rushmore Beans, Little Ball Beets, Munchkin Broccoli, Flash Cabbage, Gold Nugget Carrots, Early Snowball Celery, Ruby Red Chard, Curly Cress, Spacemaster Cucumber, Lincoln Leeks, Buttercrunch Lettuce, Little Sweetie Peas, Yolo Wonder Peppers, Russian Banana Potatoes, Baby Bear Pumpkins, Sparkler Radish, Viking Spinach, Peter Pan Squash, Alpine Strawberries, Whippersnapper Tomatoes.*

(These names are all completely real official names. They are fun, intriguing, and may compel people to try them just based on the naming.)

Companion Plants

Growing different plants together is great to do, because certain plants benefit each other. Some defer pests, while the other provides it shade. (Kemp, 2012, p. 13.) They are plants which mutually like and benefit one another. Growing them together can help them to grow better, even in containers. While some plants are neutral and have no preference, there are also plants that do not get along and can even be antagonistic when grown together. For example chives do not grow well with any form of beans. Since there is so much information on what does or doesn't go well together, it should be easily accessed based on what you are intending to grow, and it should be planned beforehand. Or, if you find out along the way, moving the plant from one container to the other is no problem.

Fertilizer

Edible plants are supposed to be given food, otherwise known as fertilizer, every other week. It is possible to make your own fertilizer – like compost tea or water from an aquarium – this helps to prevent disease. When the temperature is colder, they don't need to be fertilized as often.

Compost

This is a challenge to do in apartments and small spaces, and should only be done by someone who is an expert. It requires a bit more commitment, but can easily be done on a small scale. You can make your own compost in small containers in short amounts of time. One easy to make compost with lots of nutrients is blended coffee grounds, eggshells, and banana peels. This adds calcium and potassium to the soil. Another thing you can do is make compost tea. Just take some of your compost ingredients, soak it in a bucket with water for a week, and use the water to add to your plants. As the home gardening advances you can begin to consider getting worms for the compost.

Soil

For container gardens it is highly recommended to use organic soil, not only for the health benefits, but for the long term care of the soil. If you use non-organic soil you will have to replace it more often, whereas organic soil you can build on it without having to replace it. Different plants also prefer different types of soil which can be balanced by the type of fertilizer and nutrients. You may see different soil mixes, and its because plants grow well in different kinds of areas. For example berries prefer acidic soil, and since cities generally have more acidic soil, it works well for berries rather than other plants. There are some plants which can also be put into the soil to change the balance and filter it so it is better for other plants. If you want to test your soil to make sure it is the right quality for what you are growing there are various sources for doing so.

Photo credit: Logial-OPH1
Via Flickr

Watering

Container plants need to be watered more frequently than plants grown in the ground, because they do not retain the water for as long. You have to water more often in the summer. It is surprising that some containers need to be watered 2-3 times per week. The best way to test to see if its dry – simply stick your finger in the soil. Containers need to have holes, so that the water can drain, because it is possible for a plant to drown. In some areas tap water can be very harsh on plants and alkaline. It is suggested to let tap water sit for at least a day in the watering container before using it, or use filtered water. It is also possible to use leftover dish or shower water for your plants, as long as you use natural soap, this is called grey-water. You can also use any collected rainwater, which is ideal for plants. Plants don't like to have water directly poured on them, so if you can use a container that drizzles it, like a watering can, it will be less harsh. If you don't have such a container, you can avoid the plants and try to just directly water the soil. Watering the plant is one of the most important things to do, watering too much or too little can effect its survival, but the easiest way to tell if it needs water is to just check the soil.

MAINTAIN

These are various techniques for assuring the best conditions for the plant continually.

Container Size

The containers material is important, but perhaps even more important for a thriving plant is the appropriate size. With a bigger container you can hold more soil, and therefore have more space for roots to expand. Dan Nosowitz shares a story about his friends problems with containers in Modern Farmer Magazine saying, “at friends houses they have a cup sized pot with a pumpkin plant in it, and wonder ‘I don’t know why I didn’t get any pumpkins!’” (Nosowitz, 2009) This shows how different plants require different sized containers. For example herbs can grow in smaller spaces. As a general rule, for bigger sized produce like tomatoes, cucumbers, or pumpkins, you need something bigger. At first a tiny sprout in a big container may look odd, but over time it makes sense.

Under-sowing

You can have one plant growing in the same container as another that grows during another time of the year. There may be one summer crop growing and ready for harvest, while a fall crop is just sprouting below. Usually there is one that can protect the other, and work well together. This technique is similar to the considerations of companion planting.

Spacing

Plants need the space to grow, if the container isn’t too crowded, then plants won’t have to compete with each other for their spot in the soil. It also means above ground they each have their fair share of sunlight exposure and air. It is easy to thin plants, or move them to larger containers.

Transplant

This is the act of moving a plant to another container. It is usually done if a plant is outgrowing its space. It is a nice metaphor for kids, when they outgrow their shoes, they can not keep wearing the same ones, they need a larger size to be comfortable, just like the plants do.

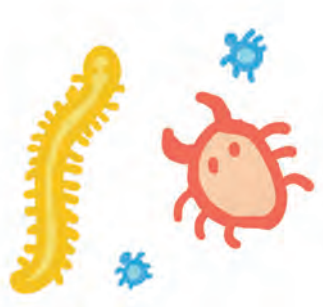
Prune

Any time you are harvesting the plant you are pruning it a little. However, if you want to keep the plant in the same container without transplanting it, you can just trim or prune it to keep it small.

Photo credit for both:
Ian Macphee via Flickr

Pests and Disease

For container gardening it is rarer to have to deal with pests and diseases, but it still happens. The containers are usually higher up or indoors so insects have a harder time reaching them, but occasionally they manage. There are some easy home remedies to ward off these pests such as baking soda or soapy mixtures. Another way to ward off pests is companion planting. You can plant more than one plant variety in the same container. Pests may find one plant very attractive, but be repulsed by another nearby, and will stay away as a result.



LOCATION

Determining the best location for the plant can directly help or hinder its growth.

Compass

South facing sun has the most sun in the morning, which is good for some plants, but for others it can burn plants or make the water in the container evaporate. When there is less soil, it dries out faster, and you will need to water more often. (Nosowitz, 2009) Some plants really love the sun, like tomatoes and peppers, so they will grow better in the south. West facing spaces get sun in the afternoon and evening. “West is best” is an old farmers saying. East facing spaces get morning sun, but can get colder strong winds, so you will need hardy and resilient plants for this space. North spaces get almost no sun in the winter time, and only a few hours in the summer. This area would need plants that love shade, there are several edible varieties that are shade tolerant. (Kemp, 2012, p. 11) The advantage of having a container garden is that if you find a plant isn’t working well in a certain area, it is easy to move and find a more ideal space.

Light and Shade

All plants need sunlight, some more than others. As mentioned previously, the amount of sun largely depends on the amount it receives in that location throughout the day, as well as where you place it. In your home you usually have a feeling for areas that are especially sunny, compared to places that receive almost no light at all, and you can place plants according to their growing preference.

Inside or Outside

Some plants prefer to be outside and usually have more exposure to the sunlight. There are different advantages to growing indoors and outdoors. Inside the plants are less susceptible to weeds or pests, but might not get any natural rainwater, or have less access to sunlight. However keeping large container gardens outside on a balcony or window keeps your living space less cluttered. The choice of inside or outside is really a personal choice.

Temperature

There are different temperatures based on the time of year, and there are different times of the year that plants prefer to grow because of this temperature. There are many guides that show ideal times to plant and harvest plants based on the time of year. You can also find temperature zones. Zones refer to USDA plant hardiness zones, which find out where plants are more likely to do well based on the location. (USDA, 2012)

Labeling

Unless you are very familiar with plants, it is great to label them in some way, so you remember what is growing in the container, and can check which stage it should be in during the process.

Tools

For container gardening, the best tool you can have is something to water with and containers, everything else is just preferential. As gardening advances you can choose to acquire more tools, but I have found that my bare hands work as wonderful tools.

Keep Learning

As you may have noticed, there are many components to gardening. The information is abundant, and free source. The tricky thing is staying motivated and finding exactly what you want to know in the abundance of information. There are fun ways to practice any try gardening, so just keep going. Food is life.

Investigations

FIELD TRIPS

Markt Halle Neun – "Planting Time"

APRIL 22, 2017

Learning about various self-sufficiency garden projects in Berlin. Different vendors with plant products from the city, workshops, as well as seeds, and plants for sale. One stand, Oleastro, brings unique edible varieties that are diverse, and probably new to the consumers. The bauerngarten has the slogan "you plant, we reap!" They were giving plants to customers, asking only for donations in exchange. The Prinzessinen Garten had a stand selling seeds. One packet was a mix of seeds specified for balcony containers, with a edible varieties. They had so many seed packets they needed a binder to present to customers.

Markt Halle Neun - Planting Time

Photo credit: INFARM

Prinzessinen Garten

APRIL 23, 2017

This is a self sufficient container garden in the heart if Kreutzburg, Berlin. They work with volunteers, and have community workshops, and even a cafe/ restaurant that uses ingredients from the garden. As they become more popular, they continue to expand.

IXDS – 'Future-Proofing Food'

MAY 9, 2017

The social design company hosts morning “pre-work talks” hosting different companies. The subject for this event was “future proofing food.” They hosted a company called INFARM, which creates indoor farming services. They grow vegetables without soil or sunlight. They are able to grow plants based on their individual needs, and through scientific measures. The benefit of this growing operation is that the food is fresh, local, and cost efficient.

Photo credit: Oliver St. Ae

INTERVIEWS

Claudia Trautmann

MAY 9, 2017

I choose to speak with Claudia because she did a project in 2012 at the Vor Ort, she created the garden with no prior experience. She created a potato field, planted several herbs, and worked with creating a mobile container garden. They decided to make it mobile in case they needed to leave or move to another space. They wondered during this project about how to incorporate a garden into the neighborhood, and as a community project it was not as successful because many people in the area already had their own private gardens. They were focused on trying to create a nice community space, also including building garden furniture. In April they participated in a farmers market, and had a stand showing the garden design. They stood out because of the design and brand of their garden being different from other farmers market stands. As a result more people became interested. The person in charge of the private gardens in Dessau agreed to see some gardens in Berlin for inspiration, perhaps on incorporating this in Dessau, but they were not as impressed by community projects. They preferred to keep their own private gardens. In this social construct, they are protective of their own space and property, and less willing to share with others in the same way. In your own garden, you have the freedom to do what you want to. Overall her experience with the garden was really easy, she didn't have any challenges with caring for them, and simply had to water them regularly. In the garden they grew many vegetables and herbs. She likes to grow watercress and spinach because it is easy to grow, throughout the whole year. She enjoys experimenting with different plants at home, and trying new things with plants.

Photo credit: Oliver St. Ae

Sabine Hogh

JUNE 14, 2017

This teacher took over the Vor Ort garden with her students. She began with about 10 students working in the garden, and now there are 3-5 that come on a weekly basis. She feels it is an important activity for the kids because they can do some practical work with their hands, and get some physical exercise while being outdoors. They should learn about this natural aspect of the world, to see how things grow, and it gives them an alternative learning mindset.

Aeron Dugan

JUNE 18, 2017

Since Aeron just recently obtained a Masters in Child Psychology and Ed. S (Education Specialist) I thought she would be an excellent resource to confirm any assumptions I had, or questions regarding the age group from age 3 - 7. She advised me that children in this age group are just beginning to understand words and becoming literate, so the content should be as visually explanatory as possible. If there is any kind of story telling it should be targeted towards the parents, and she advised me that parents should always be talking and reading to kids in order to improve the literacy. If there is text intended for children it should be short, legible, and to the point. She recommended having any content intended for the children in this age group to be at least 90% visual. The kids also like having some fun or interesting information that they weren't aware of, and even better if its interesting for the parents. This kind of trivia or fun surprising facts can keep them amused and surprised. For example, "a worm can have several hearts." It may also be able to remind the parents in subtle ways how this is effecting the child's cognitive development skills.

There does not necessarily need to be a differentiation in the activities for children who are different ages in this group, but they may gravitate naturally to different activities. As a kind of warning to the parents, it should be considered that this activity should be open to being messed up. Meaning, kids have the potential to alter things, or change things from how it is expected to turn out, but in this activity the parents should be open to this kind of outcome, and make sure they know it is okay to mess up, so the expected outcome is less frustrating. When it comes to plants, they are resilient, but not everlasting. Especially at a play ground, the parents sometimes get bored while the children are playing and resort to using their phones. The parents are usually overworked and overwhelmed, so if there is also a source for information at a playground, it can help them stay engaged.

Finally she advised that any activity that engages them through movement and touch is great for them, engaging the different senses will keep them active and amused. If they can dig, or spray, or touch during the activity they will be amused. It is also important to incorporate things with color, shape and texture because they are not yet fully literate.

OTHER

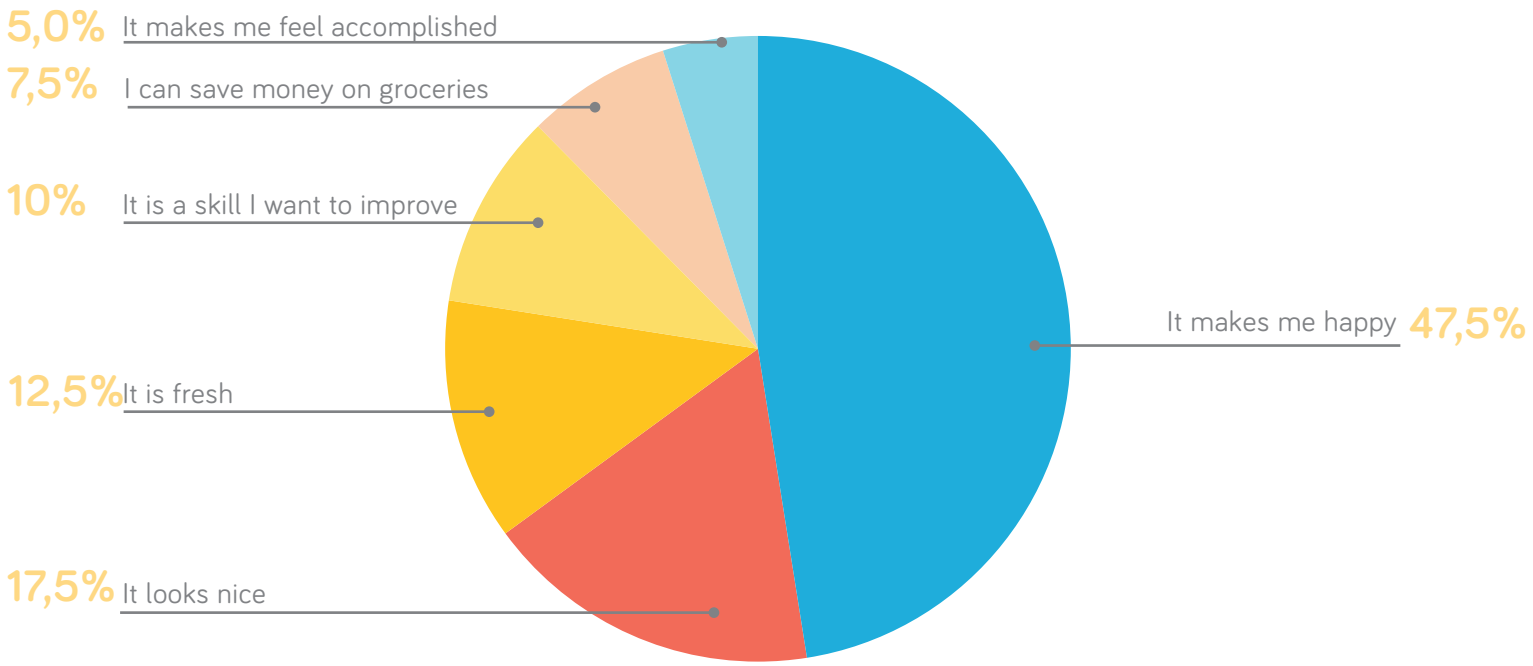
Playgrounds

As soon as I knew I wanted to incorporate playgrounds I began to visit playgrounds in the area of Dessau to observe what they entailed. The playground at Schiller park has a fortress, something to climb on, a pole to slide down, some swings, and a slide. Another playground near the center, has a slide, a sandbox, and a jungle gym. Lastly there is a swing set in the back yard of my apartment. These playgrounds showed me various structures for play, and influenced how to transform such things to apply to my project.

Hempflax

This is a spongy completely growing medium for seeds, and absorbs water like a sponge. It is completely natural, and therefore compostable and biodegradable. Producing the material is also sustainable because it requires less energy to manufacture.

Why are you most interested in gardening?



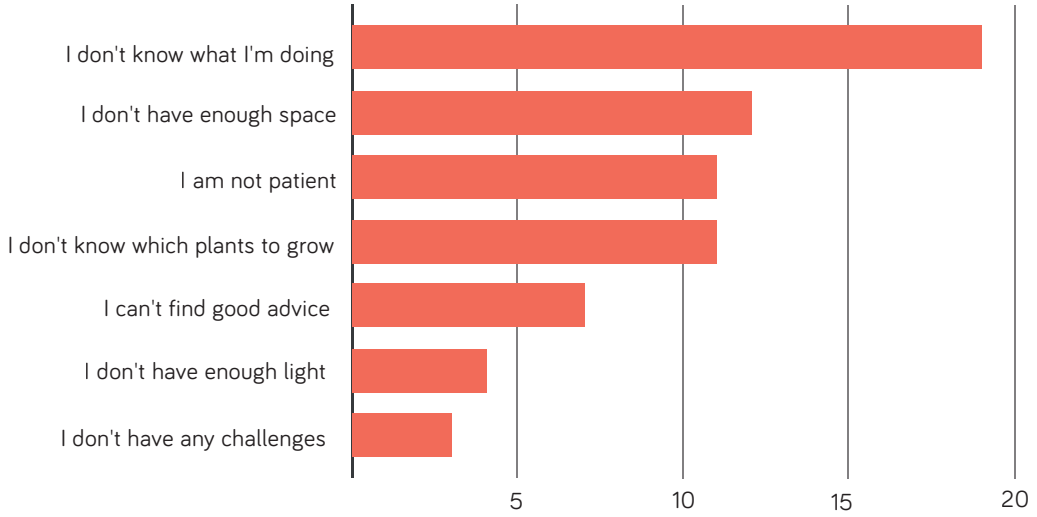
SURVEYS

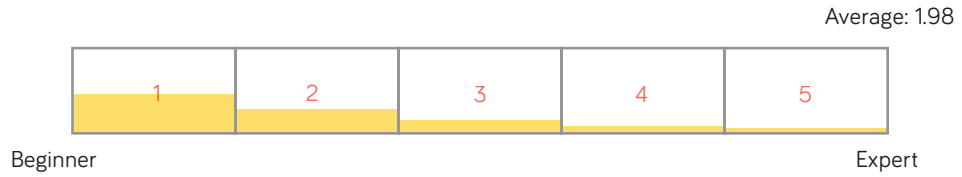
General Garden Interest

In this survey I asked a variety of people about their opinions on gardening. My initial assumptions were that people had very little space, or a lack of interest in gardening, or were not sure about what to do with different plants. Most of this was proven to be true in the quiz that was conducted, but I was proven wrong about the lack of interest. Many people feel a connection to plants, and a desire to care for them, but are lacking the knowledge, motivation, time, or space, to move forward. The various groups included international college students, parents with young children, and older people close to retiring. Unfortunately in this first survey, I did not ask details about their profile, so I was unable to decipher if there was any differentiation in the answers based on their personal profile. This mistake I made was keeping the people anonymous, and not collecting data about their age range or location, so my assumptions and information are not as concentrated as I would have liked. However, the survey did generate some interesting answers, some which were expected, and some that surprised me. This survey helped me to understand that it would be better to learn different important aspects of gardening in smaller and funner doses, so that it isn't overwhelming, it is exciting, and you want to try more.

LINK TO TYPEFORM: https://annacolleenc.typeform.com/to/xemYkH

What challenges do you have with gardening?





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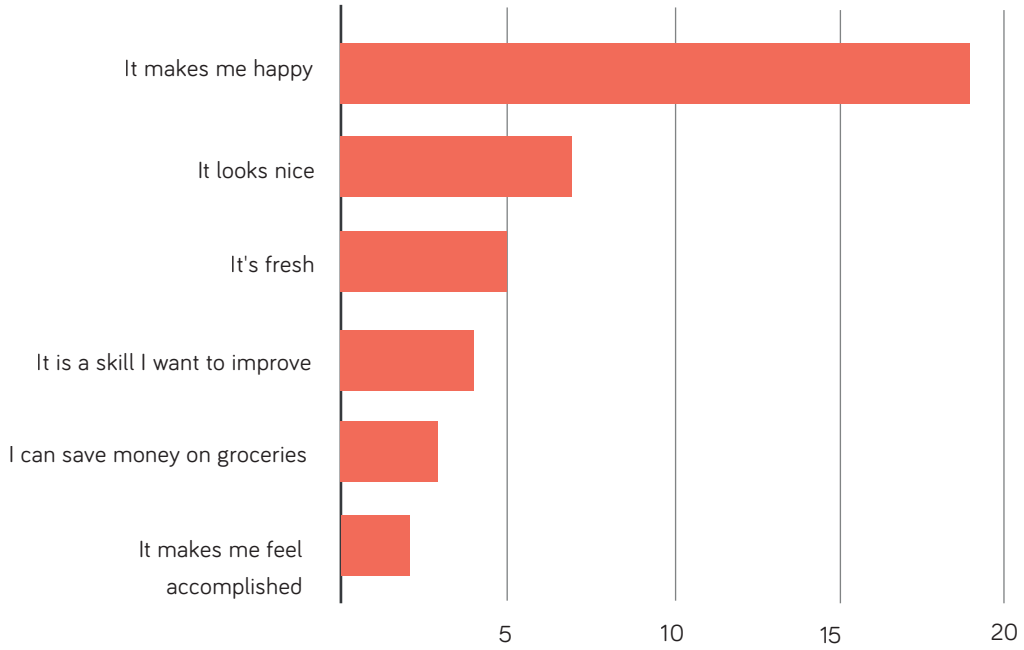
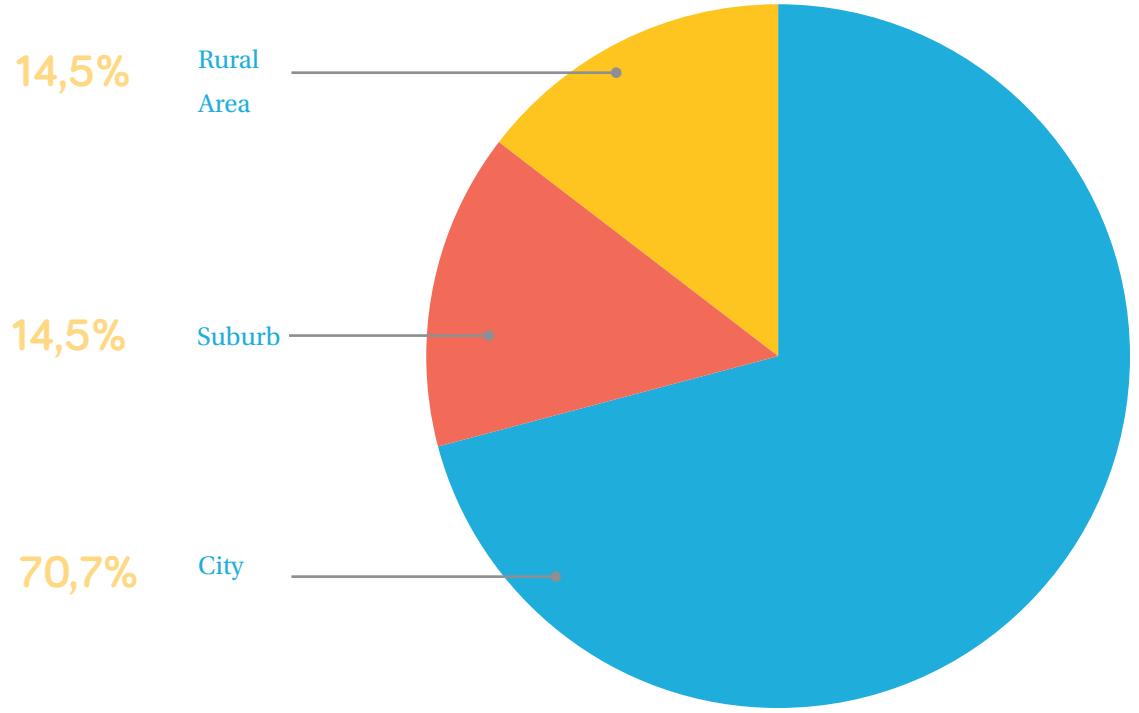
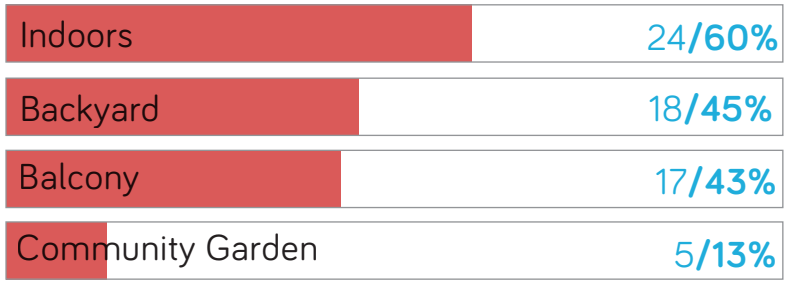


Key Insights:

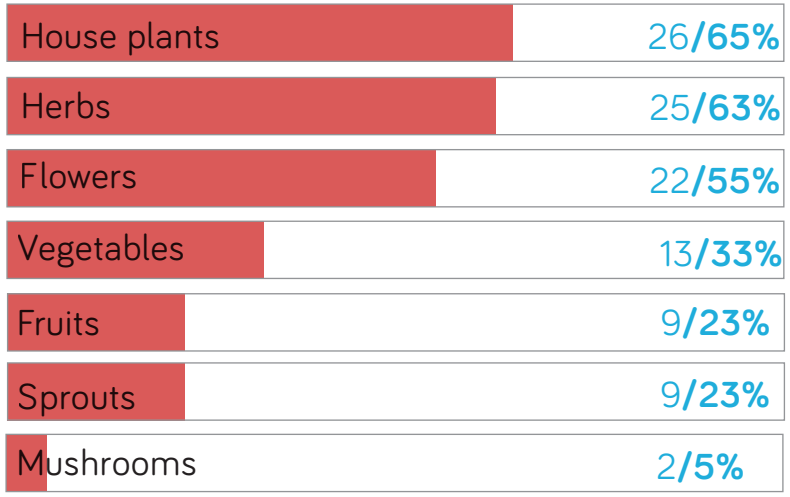
People were offered a choice between two surveys asking if they were interested in gardening or not. There were 41 people who responded 'yes', and only 5 who responded 'no' to being interested. Most people are challenged by because they don't know what they are supposed to do. A majority of the people doing the survey considered themselves beginner level. The total of 45 responded gave me a lot of insight into peoples feelings towards gardening.



Where do you grow plants?



What do you grow at home?

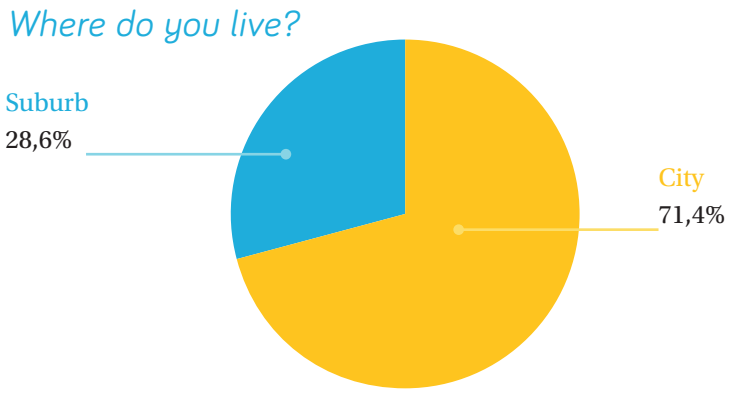


Family Activities

For this survey I had narrowed down my target audience, which was children and parents. Mainly I was interested in how their children respond to different activities, and what interests them at this age. I was able to formulate some more targeted questions relevant to the topic, and get more specific information about the users in order to create personas. I also was curious to see if there would be any difference between the opinions on gardening based on gender and asked the questions, "how do you feel about gardening?" and "how do you feel about container farming?" to see if there would be any difference based on gender. The result was that most people liked it, or they like it but its not for them. There was no distinction based on gender. There were 14 responses total, with varying responses, but I was able to discover several common threads.

LINK TO TYPEFORM: *https://annacolleenc.typeform.com/to/Pkm1Te*

Where do you live?



Key Insights

The people who responded to the survey all had children between 1-6 years old. The average monthly income was between 2,000 - 5,000 Euros or Dollars. About 90% of the responses indicated the children liked activities such as storytelling, crafts, and boardgames the most. Shortly behind was audiovisual entertainment. Every single parent said that their children respond most to visual learning. Some other learning methods with high responses were social, verbal, and physical. I asked about what characters the children enjoyed, which varied, and I was almost surprised to see that 100% of the children liked animals as characters. This is reassuring because plants can also have some interesting characteristics like animals. Plants and animals are also great companions. The parents spend an average of 20 hours per week with their children on activities. Most parents visit the playground with their children 2-3 days per week. The ultimate challenge they had to do activities was time. Most of the participants have free space on the balcony, after that inside, and in the backyard. The responses for having edible plants or only decorative plants was divided, the results were 50/50. I also asked about what they eat on a regular basis, and what kind of food they like, the results varied but bread and pasta was very consistent. Some things that kids didn't like included cheese, meat, and various vegetables like mushrooms and tomatoes.

CHALLENGES

Cost

The cost of gardening may be aversive to users because of investing in materials for this activity, so the outcome should allow access to available materials, or offer cost efficient options. The act of growing food in itself is already providing a reduced cost on produce, and as a result users can save money by doing this.

Space

City dwellers are challenged by space availability. Therefore the user should be given options to optimize the space, and be encouraged to use the available area to the fullest potential. Options and advice for how to use provided space can be provided by observing container sizes dependent on the desirable plants.

Motivation

The amount of information that is given for gardening processes can be overwhelming, and therefore less motivating to participate in. If there is easier access to information, without having to search too much, with an easy to follow storyline alongside. It may be more encouraging for users especially in small doses, or even with friendly reminders.

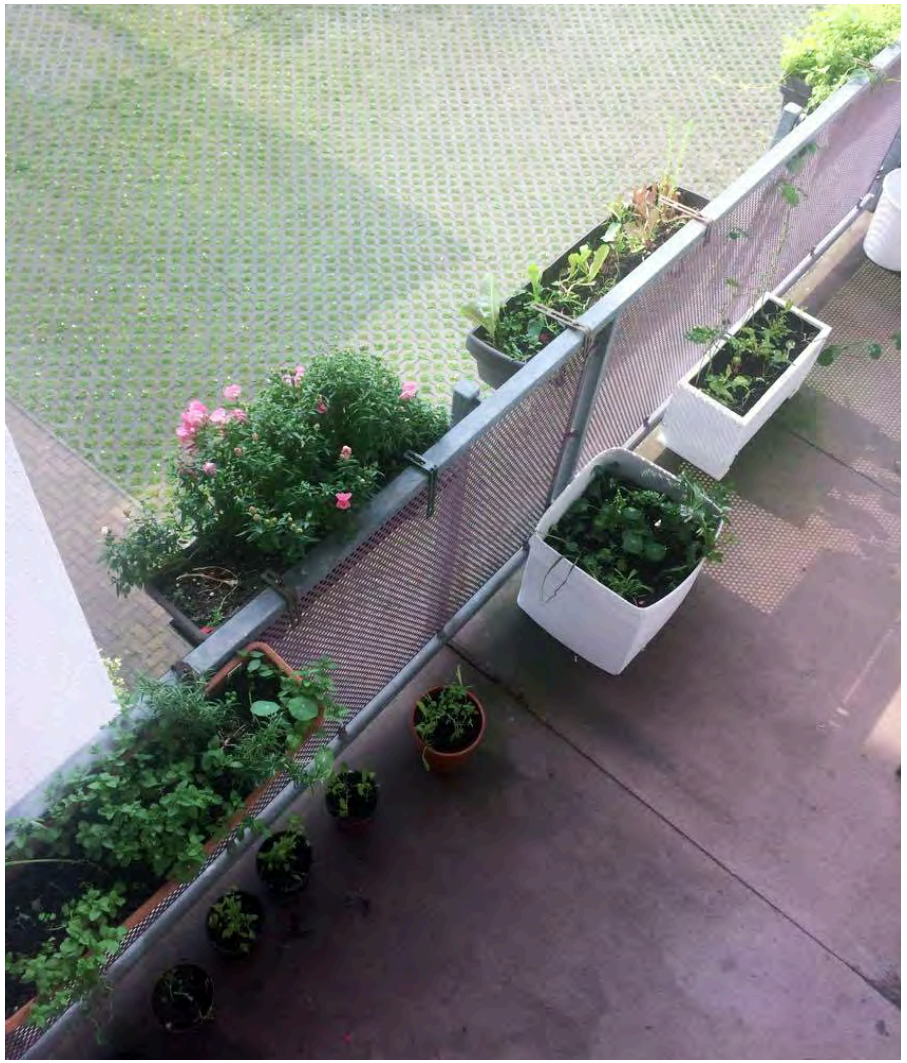
Expectations

It is hard to predict the process of growing a plant, especially without any prior experience. For beginners, managing expectations should be an important part of the process, for example knowing how the seedlings should be progressing at a certain stage, and when things should be ready to harvest. Users can be assisted in finding the right time to do things, and as a result they will hopefully have an improved outcome.

Experiments

During this process I knew a big part of my research would rely on understanding the process and challenges of home gardening. I started by gathering materials and building my own container, as well as finding some other pieces along the way. I began the process having done very little research. Some aspects of this process were quite successful, but it was the frustrations and mistakes that I made which gave me insights for the process along the way. I decided to divide the containers to see the results of different kinds of seeds and types of plants to observe which might be more successful, or how the plants interacted together.

All the parts of the first container were built from scrap wood, and then painted to keep it weatherproof. The garden box has holes for drainage and is lined with a fabric cloth. Then I filled the box with clay stones on the bottom to help with the drainage, and added organic soil, since I knew I would be growing food. I mixed in some plant fertilizer. I also eventually added a homemade fertilizer with crushed eggs, banana peel, and coffee grounds. I had purchased some small lettuce sprouts from a farm stand, so I planted them first in the container. I did a seed swap with a friend, and planted some beans I was given, without realizing they were pole beans. Since this garden box is not as shallow as my others, I tried to plant things that may extend their roots further. I had some old garlic which was beginning to sprout in my kitchen so I put it into the box with everything else. Eventually, after some more research, I learned that garlic is a great companion for many plants, but is actually antagonistic when grown with beans, so I had to uproot the garlic which had spread its roots nearly to the bottom of the container. I replanted it in another garden box which is filled with herbs. In this box I planted leftover herbs from the grocery store which often die quickly. In this garden box they are thriving, and the mint has nearly taken over. The mint also shares the container with some rosemary, garlic, parsley, thyme, basil, and kale. In a third balcony box, I added seeds from a plant mix from the “Prinzessinnen Garten” community garden in Berlin. The packet was supposed to be specially designed for balcony containers, and included several edible plant varieties I was unfamiliar with. Initially I was worried I had planted



them wrong, too early, or hadn't been patient enough starting seedlings, because nothing was happening for a long time. I felt discouraged because I wasn't sure how long it was supposed to take, and thought the balcony seeds ought to thrive in this condition. My other plant boxes were growing rapidly, and this one appeared to be standing still. To my surprise, after a very warm day and night, the little sprouts in the box appeared. It appears to be a mix of salad and greens, and hopefully it will grow more later in the summer. I have come to realize as well that different plants thrive more during different times of the year. Finally my last experience was with spinach which I planted much later on. I decided to try it since I had read that they can grow and be harvested nearly year round, and are a good plant for beginners. I put the seeds in a small container, and they started growing rapidly in almost the same week. The plants grew so quickly, I had to separate and divide them into four different containers. Now after coming up from the ground, they appear to be growing at a slower rate.

In some cases, gardening has to do with gradual learning through research, experimentation, and experience. I made many mistakes in the process of my gardening experience, and I feel that through learning and trying different methods, I have created a flourishing garden. There were however many unsuccessful experiments along the way. Based on this I learned several important things about container gardening.

Mistakes

Throughout this process I made many mistakes which taught me valuable lessons for the process. The containers I used were an adequate size, but probably too shallow, and for the spinach much too small. I should have used larger containers, the bigger the better. I have tried to remedy this by transplanting some plants into an Ikea dröna box as a container which is much deeper, and hopefully these plants will be more successful.

Since am growing several plants together in the same container, I tried to pay attention to plants that grew well together. After seeing a very visual chart showing beneficial and antagonistic plants from the Urban Gardeners Republic, I realized garlic and pole beans are antagonistic. I had to move the garlic, which was difficult because the roots had spread far and deep. Next time I will try to pay more attention to which plants to cluster together.

I always used tap water before to water my plants, but the water here is very hard and chalky which creates a thin layer of white on the plants, and it can be heavy. I discovered that letting the water sit overnight helped, and eventually got a water filter. I also learned that during very hot days the plants dry quickly and need to be watered more often, sometimes three days a week.

I was not using enough fertilizer or plant food, I found out they need fertilizer every two weeks. I am trying to make my own fertilizer with banana, coffee grounds, and egg shells.

The plants were all crowded together and competing for space, they should have been spread out more. I am trying to remedy this as they grow by moving them, however whenever they are moved they have to readjust, so it is better to plant them spaced out in the beginning.

The plants were put together very whimsically, and it would have been beneficial to have a more structured diagram of what was placed in each container. As well, the plants should have had some form of labeling, so as they grew I could remember what was planted, and possibly refer to it's progress. I would also try to keep a more vigorous journal about the plant growth and conditions to refer to for future planting.

MAY 6, 2017

MAY 10, 2017

MAY 28, 2017

MAY 16, 2017

JUNE 8, 2017

JUNE 19, 2017

The Veggie Box

APRIL 21, 2017

MAY 6, 2017

MAY 19, 2017

MAY 28, 2017

JUNE 5, 2017

JUNE 19, 2017

Balcony Mix Box

MAY 12, 2017

MAY 19, 2017

MAY 28, 2017

JUNE 3, 2017

JUNE 8, 2017

JUNE 19, 2017

Edible Flowers & Spinach Box

MAY 28, 2017

JUNE 3, 2017

JUNE 19, 2017

MAY 19, 2017

JUNE 3, 2017

JUNE 12, 2017

Transplant box

OTHER EXPERIMENTS

Mushrooms

I tried using a mushroom kit called 'Gumelo'. The outcome was really nice, after the first yield I was very impressed. Shortly after the first yield I thought there would be no more mushrooms, but to my surprise many more mushrooms appeared. Unfortunately they all dried out and stopped growing. I had almost given up because I noticed some mold and flies were starting to gather, but all of a sudden in just a few days, an enormous mushroom cluster started to grow. I enjoyed the activity and would surely consider it as an amazing experiment, but the unsureness of the process was something I decided to leave out as a potential for the project at this time.

MAY 21, 2017

JUNE 19, 2017

Sprouts

I tried some sprouts from a market which I believe were intended for a special machine, but I just looked up how to do it online and put them in a jar with a shallow layer of water. The sprouts appeared quickly, but developed over a long period of time. The water had to be replaced on a daily basis, and smelled pretty foul. In the end, not all the sprouts grew to their full potential, I decided to consider it differently for the project.

Rainwater Collection

I attempted to collect some rainwater on my balcony with a bucket, since the rainfall was quite heavy and somewhat frequent the past few months. There were several challenges, such as not being able to collect a large amount of rainwater in a small bucket, and the rainwater evaporating quickly if not used immediately. If I were to try it again, I would have to develop a more intricate system for collecting and saving a larger quantity of rain water.

Harvesting

Although the process of growing things itself is rather enjoyable, perhaps one of the best parts is enjoying them as a dish later. On several occasions I was able to make a salad, some tea,


POSSIBLE SOLUTIONS
PROBLEMS
GARDEN SHIT
PLANT CALENDAR
PLANT MATCH / TEST
COST
SPACE
MOTIVATION
EFFECTIVE-NESS / EXPECTATION
SOIL
SEED
WATER
LIGHT
QUIZ RESULTS
68% live in CITY
FAST FOOD
COMMUNAL LIVING
MEMORY
PATIENCE
ATTENTION
EDUCATION
EXPIRIMENT
PLANT DIAGNOSIS
SOIL
MARIE
JORJ
WHAT I NEED TO WRITE ABOUT

METHODOLOGY

I adopted a service design thinking technique. I found this particular process fitting. Throughout the process I incorporated design thinking techniques for different approaches.

Exploration

For this step I browsed through trends, to look for consistent patterns, innovations or mindsets that are fitting or appealing. Since I have always been interested in gardening and saw it as an important and relevant emerging topic I chose to go in this direction. My main goal for this stage was to discover relevant topics.

Inspiration

During this stage I sought out inspiration through research, discussions, and surveys. I wanted to become more informed, question the techniques. In this stage I began using post-its to seek connections.

Creation

I explored mistakes that were made during experimentation. During this time I brainstormed different possible solutions for my problem, and tried to visualize and outcome. I used some techniques like future casting to try to envision how the topic could be in the future, and how this could make an impact. During this stage I was able to evaluate and narrow down my focus.

Reflection

I was able to consider if this was fitting for my target group, and if it fits their needs. I envisioned scenarios, how the service might be applied, and how this would intervene on the user to benefit them in their daily life.

Implementation

In this stage I am able to communicate my concept, and have a clear vision of how the service works and functions. The service blueprint is in place.

Photo credit: urbanhen
via Flickr

CONCEPT

As observed there is a need for reintroducing edible plants and greenery into the city, and it is especially vital for children in order for them to learn about food and nature, as well the parents are an important part of this process in learning alongside their children. The service is discovered by users through visibility in commonly visited areas such as a playground, or through word of mouth. The initial discovery point would be a playground where the play structures serve a dual purpose for supporting growing plants. The playground shapes are ideal for plants, because it provides plants that grow upwards a support to climb on, and it provides shade for plants that can not bear the heat of the sun. In some cases the plants even form the play structures. The playground is maintained by volunteers, and gives parents an activity to participate in as the children play, or they can explore and harvest plants together. The children may also participate in the care for the playground. There is an informative area in which you can borrow tools such as watering cans and kid friendly cutters, the kids can also dig, play, and plant if they choose to. At this information structure are several kits which encourage parents and children to invite the elements from the playground into their home. Since they aren't able to visit the playground on a regular basis they can bring the kit home to continue the activity. The kit focuses on the personalities of the different plants, as well as teaching children and parents about different aspects of caring for container plants as a one by one process. The kit has some activities and lessons planned for kids to continue in the process of the kits growth, and there are ways to contribute to the ongoing growth, for example at the playground, the kits seeds change on a regular basis, and when one plant goes out of season they can add another to grow in the same container at a different time of year. The availability of the seeds is always based on the time of year, and when they are acquired they should be used within the same time period. The material for lessons can also be found online and printed by the parents in order to continue with activities if they are unable to visit the playground.

I imagine this initially being implemented in European cities, funded and sponsored by environmental organizations. When the service is proven to be successful, hopefully it can influence other countries where food and nature education is absolutely vital, like in the United States.

DESIGN THINKING METHODS

Journey Map	Start	Intro	Decide / Begin	Engaged	Ongoing
Actions	Find out from a friend, child heard at daycare, word of mouth, friends sharing.	Visit for first time, decide to bring product home, discover playground, intrigued by project.	Choose, begin home activity, "adopt plant", test kit, see if child is engaged, learning activities.	Continue use, see if it is liked, try more kits, participate in online information, look for additional info and activity.	Find online resources, or return to playground and pursue activities – volunteer or expand at home.
Emotions	Curious, unsure, committed, happy.	Excitement.	Dedication, interest.	Thoughtful, observant, patient.	Inspired.
Thinking	Can I mess up, is there enough space, this is affordable, this is interesting.	Nice interesting project to do with child, activities seem intriguing.	Am I doing this right, wow my plants look amazing, I am learning so much.	Where can I find out more and keep going with these activities.	How can I be more involved and continue this as a hobby.

Persona 1

Maggie

Age: 3
Lives in Berlin
Personality: Shy

FAVORITES

Animal: Deer
Color: Orange
Food: Pasta
Show: Octonauts
Activities: Dress-up

INTERESTS

She is very observant and likes to see how things work, she is curious, observant, and creative. When she plays she is very imaginative and likes to create stories. When she visits the playground she likes to go on the slide, and she likes to find spaces where she can play with 'make believe' materials. She spends some time with her friend at daycare, where she goes three days a week.

PROBLEMS

She hasn't had very much exposure to nature because she lives in the city, she sometimes goes to the park with her parents and older sister, but she mostly stays inside at home or at daycare.

GOALS

Maggie's goals are mainly set by her parents. She is not sure yet what she wants, and is influenced by others. When she participates in the service, based on her interest, I think she will be very engaged and interested.

Persona 2

Homer

Age: 37
Profession: Medical Appliance Technician
Personal: Married, 2 kids, boy age 5, girl age 3
Lives in Framingham, Massachusetts

INTERESTS

Spending time with his family, playing card games, reading the newspaper, meeting with friends for dinner.

HOBBIES

Playing guitar and jogging.

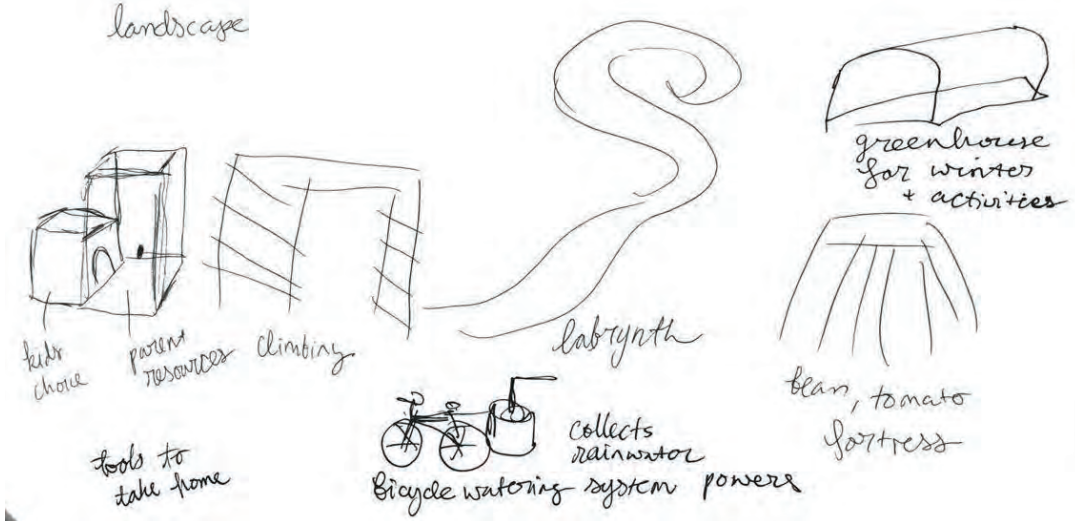
NEEDS

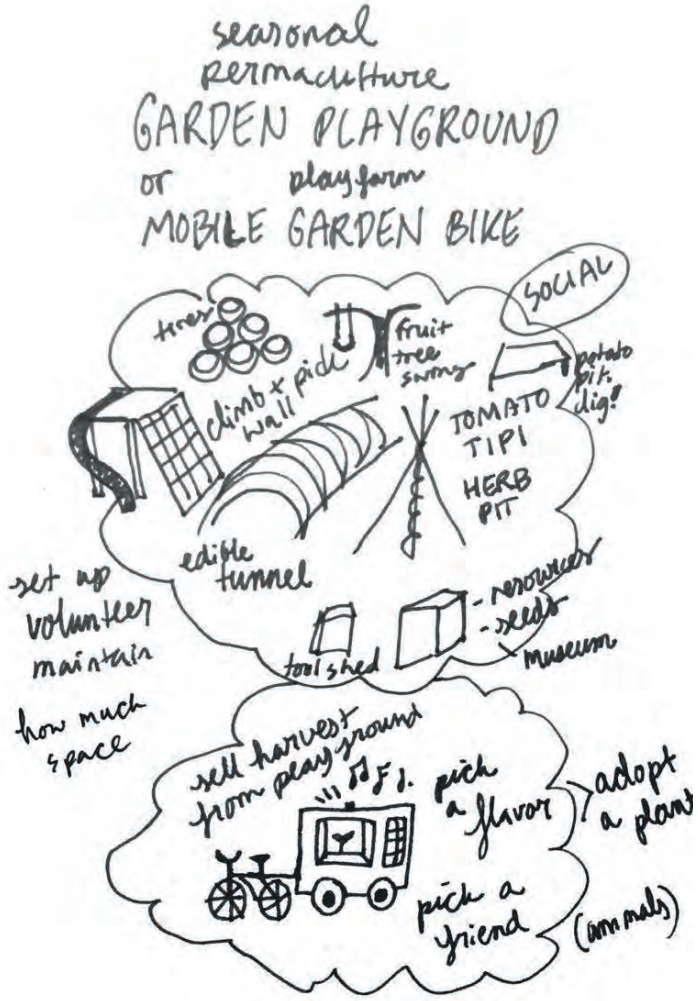
He wants to be promoted, so he is working really hard. During his free time he wants to do activities with his kids, and noticed they aren't able to go to the playground as often, and wants to bring activities home. He doesn't have much space at home, but has a balcony and indoor space. His parents used to have a garden when he was younger. He usually cooks with his wife, and is missing easy and fresh ingredients.

DESIGN

The design is mainly focused on the service and how it is implemented and accessible to the user, as well as how they will be guided throughout the process. This is important for children because it improves their cognitive development, and teaches them ownership and responsibility. It is important for both children and parents to learn about food, and to be exposed to nature. Children and parents will learn different lessons about how to care for plants, like re-potting, watering, and time of year through different activities. The activities may include games, coloring and drawing, crafts, calendars, and storytelling. The storytelling is an important aspect for the children because they can then relate to the plants. The plants are portrayed as characters with unique personalities. The activities, seasonal seeds and kits can be found at the playground, or as an online deliverable / printable resource. The service can initially be implemented by a government association, or environmental sponsor. The kit prices are based on donations with suggested prices, of course online there are shipping costs. As the popularity grows it can naturally expand to other areas.

Sketches


landscape
greenhouse for winter + activities
labrynth
bean, tomato fortress
kids chore
parent resources
climbing
tools to take home
collects rainwater
Bicycle watering system powers


seasonal
Permaculture
GARDEN PLAYGROUND
or playfarm
MOBILE GARDEN BIKE
SOCIAL
trees
fruit tree swing
potato pit. dig!
climb + wall
pick
TOMATO TIPI
HERB PIT
edible tunnel
set up volunteer maintain
how much space
tool shed
- resources
- seeds
museum
sell harvest from playground
pick a flavor
adopt a plant
pick a friend
(animals)

Implementation

First step – leaving the home to go to the Growopolis playground.

Discovering different activities at the playground, noticing if child is enjoying it.

Finding out more, accessing information, taking a piece of the playground home to continue.

Choosing a kit that is fitting for your home, space, and even child's personality. Kits based on time of year so it can be started immediately.

Information comes with kits including activities for children, stories about plants, calendar to track progress, and information on additional sources.

Retrieving more information on the Growopolis website in order to continue activities, and find out more about the community.

CONCLUSION

Growopolis is a place to grow in cities and rural areas, it is an edible oasis at home and away from home for parents and children. It is a result of a lack of connection to nature in todays society, and retraining children and their parents to find a piece of it again. Parents can teach their children about food and nature, but learn and share new things alongside them as well. Adding more green space to cities is beneficial for the environment, and for general well-being of people. This project intends to stimulate the curiosity and interest of children towards nature through hands on activities. Teaching children as well as improving their cognitive abilities can only have positive effects on them, their parents, and hopefully the environment as well.

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Confirmation of Authorship

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All quotations and paraphrases but also information and ideas that have been taken from sources used are cited appropriately with the corresponding bibliographical references provided. The same is true of all drawings, sketches, pictures and the like that appear in the text, as well as of all Internet resources used.

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