GARDENING TOGETHER

Enhancing the shared experience of gardening through designing with dilemmas

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MSc. Design for Interaction
Faculty of Industrial Design Engineering
Delft University of Technology

Author
Fabienne Wijshoff [5612934]
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Supervisory team
Chair
Dr. ir. Değer Özkaramanlı
Department of Human-Centred Design

Mentor
Dr. Haian Xue
Department of Human-Centred Design

Client
Talen Tools

TABLE OF CONTENTS

ABSTRACT

Within this report, we explore the opportunities of the enhancement of well-being among hobby gardeners in the Netherlands using the principles of Positive Design realized through the methodology of Dilemma-Driven Design. Data was collected through qualitative in-depth interviews involving 12 participants who all engaged in either home, community or pot gardening. These interviews primarily focused on the exploration of the emotional landscape and pinpointing the underlying dilemmas experienced within the corresponding gardening context.

The research process involved thorough analysis of interview results which led to dilemmas which offered a base to the ideation process employed within this project. Through ideation and iteration, a creative solution could be generated that holds promise for fostering human flourishing. In lines with the principles of Positive Design, this condition is key for enhancing subjective well-being and offers an insight on the potential of design to contributing to this within the domain of gardening.

Prior to the field research, extensive desk research and a literature review was conducted, where the existing sources between well-being and gardening were explored. Additionally, the role of gardening tools within the aspect of how they contribute to well-being was explored, given the collaborative nature of this project with the company Talen Tools, renowned for its high quality gardening tool craftsmanship.

As a final result, this project offers a new perspective on how designers can harness Dilemma-Driven Design to actively contribute to Positive Design, embodied through the design of the "PocketHelp", a device that aims to overcome the dilemma of desiring help from fellow gardeners without seeming helpless, which is a dilemma commonly faced by community gardeners within the gardening complex Delftse Hout. The project offers insights into various design strategies which can be utilized to the enhancement of subjective well-being, in this case particularly within the context of communal gardening.

KEYWORDS: dilemmas, well-being, design, gardening, tools

1. INTRODUCTION

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In the face of technological growth and design innovations, it has become increasingly important for designers to create products that not only offer temporary satisfaction, but also encourage lasting happiness. As designers, we want to achieve more than short-term pleasure with design; we aim to develop our understanding and our competencies in creating designs that not only satisfy immediate desires, but also contribute to the long-lasting well-being of individuals (Desmet & Pohlmeyer, 2013).

Gardening has generally been studied and advocated as a method for improving mental and physical health. Due to these characteristics, multiple articles have underlined the ability of gardening to enhance mental health and subjective well-being through heightened physical activity and fostering social relationships (Soga et al., 2017; Thompson, 2018; van Lier et al., 2016). Yet, within this research, a gap remains which has not been explored yet – the relationship between design and the enhancement of well-being among gardeners.

1.1 Company collaboration

This project is conducted in collaboration with the company Talen Tools, an important manufacturer in the field of gardening tools and equipment in the Netherlands. Talen Tools has recognized the unique potential of design in enhancing the state of well-being among individuals and as a company closely involved with gardening individuals, has therefore invested in researching innovative, user-centred gardening solutions that will contribute to a happier and more fulfilling gardening experience.

1.2 Positive Design framework

To discover how design can influence the positive enhancement of well-being among gardeners, we make use of the framework of Positive Design, developed and researched by Desmet & Pohlmeyer (2013). Positive Design supports the creation of products and services, where through combining three key components of subjective well-being, achieving human flourishing is key. The combination of the three key components which are: Design for Virtue, where being a morally good person stands in the foreground, Design for Pleasure, where we focus on experiencing positive affect and Design for Personal Significance, where we look at pursuing personal goals; show us that design should not only support temporary joy, but rather focus on enhancing personal growth, lasting happiness and meaningful engagement. Not only does this approach help in finding a connection between design and promoting well-being, it also connects closely to the essence of gardening, where gardeners do not only aim to care for plants, but also want to connect with nature, have a space to think and engage in physical activities.

1.3 Dilemma-Driven Design method

While there is an abundance of research which emphasize the positive impact of gardening on well-being itself, there remains a gap in this context to which extent design can enhance this effect. This project aims to exploratively discover the capabilities of how design, in combination with the already reinforcing characteristics of gardening, can support the well-being among gardeners. Through the methodology of "Dilemma-Driven Design" (Ozkaramanli et al., 2020), centred on the identification of conflicts and challenges within a studied target group, we aim to discover how we can retain and improve well-being amongst gardeners and pinpoint key areas where our role as designer can contribute to the augmentation of human flourishing.

Through Dilemma-Driven Design we get offered an unique perspective on Positive Design as we identify dilemmas within the gardening context and discover obstacles

which may hinder current well-being. By addressing these dilemmas we can not only develop design solutions which mitigate challenges, but also actively promote positive experiences and well-being as aimed for within Positive Design.

1.4 Ideation

In this project, we use a variety of idea generation methods to connect ideas and develop a solution for a dilemma commonly faced by gardeners inside a community garden. The dilemma revolves around gardeners wanting to receive help from peers while avoiding any potential decrease in self-worth due to appearing helpless when asking for assistance. Through design, we aim to solve this problem by facilitating indirect communication with other gardeners.

1.5 Contribution

The findings of this project provide a start to the capacity of how design can contribute significantly to human flourishing within the gardening context, emphasizing and closing the gap on the role of design in fostering lasting happiness among gardeners. Concluding to this project, we should strive to continue exploring how design can furthermore enable long-lasting well-being within, but also outside of the gardening context.

2. LITERATURE REVIEW & DESKTOP RESEARCH

2. LITERATURE REVIEW AND DESKTOP RESEARCH

Exploring the core of well-being in gardening and design

To find connections between experiencing human flourishing and design within the gardening context, this literature review focuses on the various research findings of gardening's impact on human well-being, as well as the role of products and services within this context. By looking at the context through the perspective of Positive Design, we aim to bridge the gap between design innovation and sustaining well-being.

In the course of this project, we want to explore gardener's experienced dilemmas within a social context to promote increased well-being through design. This review provides a scope on existing research surrounding gardening's relationship with well-being. We look at understanding the individual and social aspects of gardening practices, with a specific focus on the Netherlands as the setting of this study. Through desktop research, we will as well explore gardening-related products and services that are currently on the market.

2.1 Gardening's impact on well-being

Gardening has been known to be an attractive activity for over century, as it is a hands-on activity that gives space to think and reflect (van Lier et al., 2016) Its combination of physical activity, social interactions and exposure to nature and sunlight has contributed to its reputation of being a healthful pursuit (Kingsley et al., 2009; Thompson, 2018; van Lier et al., 2016). Sunlight, for example, lowers blood pressure & increases vitamin D levels and physical interaction with nature can be seen as an alternative to gym, which is comparably cheaper in most cases (Thompson, 2018). This can protect individuals from health risks such as cardiovascular disease (Kingsley et al., 2009). The communal setting of gardens have emerged as a remedy for social isolation

(Thompson, 2018) and stress (Kingsley et al., 2009; Wakefield et al., 2007).

Studies in New Zealand highlight the positive associations between home gardening and dietary habits, physical activity, mental health and social relationships among secondary school students. The study confirmed that gardening in general meant healthier dietary habits, such as eating more vegetables and fruits and physical activity was increased, which all contributed to a decrease in levels of depressive symptoms. Additionally, increased familiarly connections due to gardening with family were reported (van Lier et al., 2016). A formal meta-analysis of research examining the effects of gardening on health, provided a quantitative synthesis which affirms gardening's dual benefit for physical and psychological well-being (Soga et al., 2017). Moreover, research suggest that the act of gardening, and even observing nature, can have positive effects on mood and mental health. Thompson (2018) even argues that gardening might be used as an alternative to drugs used in healthcare, as trials have revealed the positive effects of observing nature on well-being. He summarizes studies where comparisons are present between being in a natural green environment or observing a natural green environment and abstract images and the absence of greenery, where in the latter people had more negative psychological implications (Thompson, 2018). However, we acknowledge that gardening has potential physical strains and risks. Research shows that especially for older gardeners aged 65 and older, gardening may burden the body and cause injury. Many gardening positions, such as squatting, stooping and kneeling can result in fatigue, physical pain and injuries as it burdens knees, spine and back (Tomar, Kasar, & Tiwari, 2016).

2.2 Community gardening's impact on well-being

Next to individual gardening, community gardening has also gained attention as a contributing factor to well-being.

A quantitative study in Singapore on the relationship between gardening and stress, subjective well-being and resilience potentials & factors, reveals a higher subjective well-being among community gardeners, driven by social connections. During the study, community gardening was compared with home gardening and non-gardeners and concluded that community gardeners reported a significant higher level of subjective well-being. Social relatedness has been found to predict happiness, however the study did not show a significant relieve in stress between community gardeners and home-gardeners. A conclusion is that especially with nowadays urban developments, community gardens offer a way for restoring ecological, as well as natural connections (Koay & Dillon, 2020). Studies from the UK also point to increased self-esteem and mood among allotment gardeners, where it was proven that the length of the gardening activity however had no significant impact on the state of well-being (Wood et al., 2016). The consensus on gardening being an activity that enhances well-being has led to multiple suggestions for promoting individual gardening, as well as creating communal spaces (Kingsley et al., 2009; Koay & Dillon, 2020; Soga et al., 2017; van Lier et al., 2016). Some suggest government should facilitate investing in interventions to encourage people to participate in gardening (Soga et al., 2017) and others encourage the creation of communal spaces for community gardening in urban areas as it can be viewed as a strategy to enhance mental health in these areas (Kingsley et al., 2009; Koay & Dillon, 2020).

In the context of the Netherlands, the geographic focus of this project, the landscape of allotment gardens has witnessed a reduction in acreage over the years ("StatLine - Bodemgebruik; uitgebreide gebruiksvorm, per gemeente," n.d.). Yet, according to Herman Vroklage, from Algemeen Verbond van Volkstuindersverenigingen in Nederland (AVVN), during the COVID-19 pandemic, a resurgence in interest sparked, as amid lockdowns, allotment gardens emerged as sanctuaries, providing a safe space for social interactions while adhering to the safety regulations ordered by the government ("Volkstuinen zijn populairder dan ooit: wachtlijsten zitten overvol | Binnenland | NU.nl," n.d.).

2.3 Design within the gardening context

Next to the inherent gardening factors in relation to well-being, there are many touchpoints for design within the gardening context. The most common role towards design within the gardening space are designing the garden itself, designed features within the garden, such as decorations or garden furniture and gardening tools utilized within the garden.

2.3.1 Garden landscaping

Similarly to the design of houses, there are architectural aspects to the design of the gardening environment. Individuals themselves are able to choose freely, according to their own preferences, how to design their gardening space, whether it be a garden itself or the arrangement of plants within a home. In cases of home owned gardens, owners might even hire landscaping architects in order to fulfil their needs.

Often, people tend to see their garden as an extension of their home. Through the garden they are able to display their identity as it is a place where they can facilitate their creativity as well as originality (Gross & Lane, 2007). Some gardeners prefer to design their garden

aimed at productivity. Through the implementation of vegetables or other usable vegetations, gardeners aim to make use out of their garden. Not always is this process about achieving use out of the crops, but also about connecting with nature and earth itself (Freeman, Dickinson, Porter, & van Heezik, 2012).

2.3.2 Gardening tools

To achieve a desired design within a garden, tools are utilized to shape nature according to one's own preferences. Therefore, these tools are an important factor, and considered the main focus of this project, aiming to connect the aspects of design, well-being and influence of the collaborating company within this project.

Research shows that a main goal during gardening, especially concerning tools that are being used during the gardening activity, seems to be efficiency. Efforts to enhance tool efficiency through design, such as automated lawn mowers (Figure 1) and automated tools monitored through mobile apps have been explored (Gowri & Divya, 2016), as well as ergonomics, for example through handle variability (Rok Chang et al., 1999) has come forward, such as the PETA UK Ltd Easi-Grip (Figure 2). While efficiency seems to be a key factor, the balance between health considerations and efficiency is also highlighted, as gardeners value exercise and careful cultivation (Chen et al., 2022).

Figure 1 - Husqvarna Automower® 320 NERA. Automated robot lawn mower.
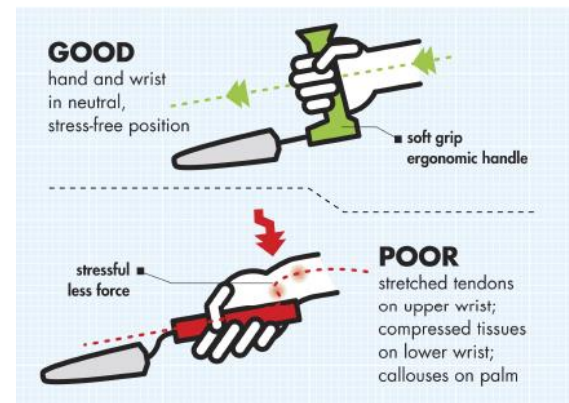

Figure 2 - PETA UK Ltd Easi-Grip®. Schematic about ergonomic advantages of the Easi-Grip®.

Figure 3 - Gardena Oscillating Sprinkler Aqua L. Wide ranged, oscillating water sprinkler.

Figure 4 - Museum Collection Flower Water Sprinkler. Water sprinkler with flower design.

However, in "Application of Branding Canvas Method in Mechanical Modified Hoe", Putri, Rahman, Fauzi & Putri (2019) point out that with added value, working tools, which are focussed on providing ease and increased efficiency, can be rebranded as "Hobby Tools", where the focus of the product lies within achieving "fun" rather than minimizing effort for maximum results for increased efficiency during gardening. One example is the Flower Water Sprinkler provided by Museum Collection ("Flower Water Sprinkler | Garden Accessories | Museum Selection," n.d.), visualized in Figure 4, where instead of the common, efficiency focused, wide-ranged sprinkler design, such as the Oscillating Sprinkler Aqua L made by the company Gardena, as seen in Figure 3, is reshaped as a decorative, yet still practical design as it fulfils the purpose of watering plants.

2.3.3 Beyond tools: Expanding the gardening experience outside of the garden

Gardening's influence extends beyond physical engagement in the garden itself. Digital co-op games such as "Stardew Valley" ("Stardew Valley," n.d.), shown in Figure 5, and gardening themed board games such as "Cottage garden" (Rosenberg, 2016), seen in Figure 6 provide access to the gardening experience while not actively engaging in the gardening activity itself. The spread of books on gardening (Smyth & Gavin, 2022) and blogs, where users share their gardening experiences ("Gardening With Friends," n.d.) makes knowledge sharing amongst gardeners possible.

Figure 5 - Stardew Valley. Online gardening co-op game.

Furthermore, the sharing economy introduces services, where gardening tools ("Library of Things | Borrow useful Things for your home, projects and adventures," n.d.) and even one's own garden ("Gardening Together Popup allotments," n.d.) can be shared amongst interested gardeners.

Figure 6 - Cottage Garden. Co-op gardening board game.

2.4 Conclusion

In conclusion, the promotion of gardening as a contributing factor to enhancing well-being has been researched and recognized broadly. The positive impact of gardening, as supported by various researchers, draws attention to the promotion of gardening as a healthy activity. While studies especially emphasize the advantages of community gardens over non-gardening alternatives, there remains a gap in understanding the well-being of active gardeners and whether and how the relationship between well-being and the potential influence of design can be facilitated within this group.

In line with the principles of Positive Design, this project aims to explore well-being among committed gardeners and fill the gap of connecting gardening, design and well-being by investigating the well-being aspects of committed gardeners in depth. Through the "Dilemma-driven design" method, we aim to discover the challenges and conflicts intrinsic to gardening and the interactions within its social context. This approach serves as a bridge between connecting the challenges which obstruct achieving well-being with the

principles of Positive Design and therefore the enhancement of the well-being of gardeners.

With this project, by exploring the connection between well-being and gardening, and by using design to make a difference, we seek to enrich the state of well-being of gardeners.

3. METHODOLOGY

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Exploring well-being through Dilemma-Driven Design

To guide data collection and analysis and as a bridge between theory and actionable insights, we will explore well-being within the gardening space through the methodological framework of "Dilemma-Driven Design" (Ozkaramanli, Desmet, & Özcan, 2020). Dilemma-Driven Design (DDD) allows us to qualitatively explore the gardening context and shows us which factors influence the achievement and loss of well-being within the gardening space. DDD will help us build onto Positive Design by gaining meaningful insights. Through the identification of challenges and areas of friction, it guides us designers in pinpointing opportunities for intervention to increase potential well-being. This section explains the structure used within this project to aid understanding how through identification of dilemmas we can create design that can enhance well-being among gardeners.

3.1 "Dilemma-Driven Design" method

The "Dilemma-Driven Design" method, developed by Ozkaramanli et al., (2020) allows us to dive deeper into the challenges and conflicts experienced during gardening and the relationships within its social field and provide space for creativity in human-centred design. By gathering data on emotions and goals from individuals, dilemmas are identified. Dilemmas are defined as having to choose between two different goals whose mutual realization is either impossible or hard to achieve. These dilemmas result from a set of relevant personal concerns which contain unresolved tensions or conflicts (Ozkaramanli et al., 2020). An example of such a dilemma is shown in Figure 7. Through focusing on dilemmas, we aim to see which underlying conflicting emotions or goals are felt during gardening activities, to be able to see which design interventions can be created that will nurture their well-being.
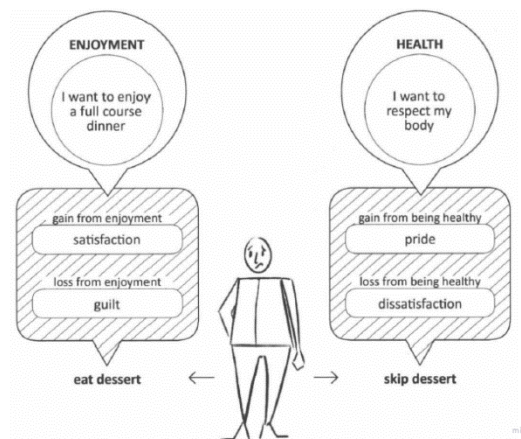
Figure 7 - Example of a dilemma where the individual has two opposing concerns concerning indulging a dessert as part of dinner.

Through systematic data collection in form of in-depth interviews and thematic analysis, we look for insights that provide a foundation for informed decision-making concerning designing for well-being.

3.2 Positive Design framework

To evaluate when a design contributes to well-being, the Positive Design framework, developed by Desmet & Pohlmeyer (2013) was utilised. This framework identifies three key components within design – virtue, pleasure and personal significance – that contribute to human flourishing and therefore subjective well-being. Therefore, this framework is utilised as part of the evaluation of concepts within this project.
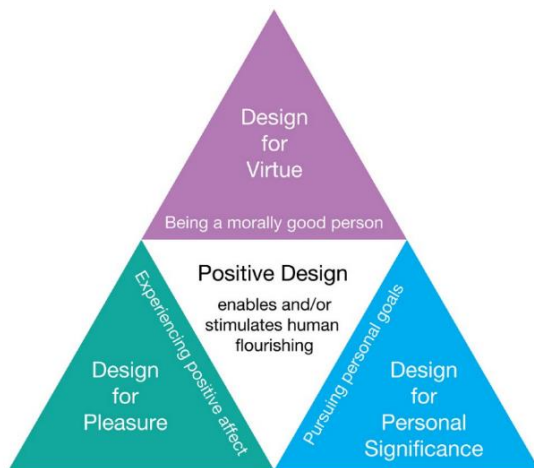
Figure 8 - Schematic Positive Design framework (Desmet & Pohlmeyer, 2018).

The three key components within Positive Design are devised to promote human flourishing as follows:

1. **Design for Virtue: Being a morally good person**

Designing for virtue places a primary emphasis on moral goodness. It revolves around the ideal standard of behaviour and actions within society, that are considered socially desirable and virtuous. Design should therefore promote and foster virtuous behaviour within society.

2. **Design for Personal Significance: Pursuing personal goals**

Designing for personal significance involves enabling individuals to pursue their personal goals, whether they are short-term or long-term in nature. Design should facilitate the realization of these goals, beyond achieving momentary happiness, and provide the possibility to work towards lasting personal fulfilment.

3. **Design for Pleasure: Experiencing positive affect**

Optimizing the present moment is central within designing for pleasure. It concentrates on enhancing positive emotions, diminishing negative feelings and ultimately enhancing the experience of pleasure itself. Design can promote the experience of positive emotions, provide a buffer against negative emotions and be a direct source of pleasure itself, including facilitating pleasurable activities.

With these three key components define what designing for subjective well-being means, working towards a feasible design direction that, through meeting these three factors is promised to contribute to human flourishing and, consequently, subjective well-being.

3.3 Dilemma-Driven Design and Positive Design

Within this project we combine the Dilemma-Driven Design method with the framework of Positive Design, as it enables us an unique perspective on well-being. Through DDD we are able to define key elements of conflicts within the gardening domain that contributes to the loss of subjective well-being. By pinpointing these moments of conflict, we are able to find opportunities where we can utilise design as a means to enhance well-being. Throughout the process of creating suitable designs, the Positive Design framework serves us as a guideline, ensuring that our design interventions prioritize the well-being of individuals within the garden.

Simultaneously, Dilemma-Driven Design helps us build onto Positive Design, as it offers us insights into how designing with dilemmas provides the space and opportunities to explore the three contributing factors of Positive Design. Dilemma-Driven Design provides direction in addressing conflicts directly correlated with well-being, enriching our approach to design to design in the garden context.

13

3.4 Research questions

The project is guided by the following main research question:

How can design facilitate the bond between gardeners in a community while gardening together and therefore improve their well-being?

The following sub-questions were defined to guide the research process and provide a systematic exploration of the research objectives, as well as provide insights on the context for which we are exploring to design for:

1. Gardening individuals
- Who are the individuals that garden together?
- How does the experience of gardening solo compare to the experience of gardening together?
- What value and personal meaning does gardening have for the individual and what motivates individuals to participate in gardening?

2. Act of gardening – Dilemmas
- What specific dilemmas and challenges do individuals encounter during their gardening activities?
- What factors cause these dilemmas?
- What underlying values and emotions can be discovered through these dilemmas?

3. Tools
- How are gardening tools being perceived by gardening individuals?
- What meaning do gardening tools have to gardening individuals?
- Why are gardening tools being used while gardening?
- How do gardening tools contribute positively to the gardening experience?

4. Design related
- How can the values and emotions discovered through dilemmas contribute to a design direction that will improve the gardening experience, and eventually, contribute to wellbeing?
- How can we, through Dilemma-Driven Design, create a design that enhances well-being, taking into consideration the Positive Design principles?

These research questions enable the exploration of the relationships between gardening, well-being and design, aligned with the principles of Positive Design. By addressing these questions, the project aims to show insights that contribute to practical design implications, as well as provide a greater understanding of well-being within the gardening experience.

4. DATA COLLECTION

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To obtain relevant data throughout the project, data collection was guided by different steps. Firstly, three different gardening segments were defined through desktop research, as well as through a short survey inquiring on the different gardening styles. For those three segments – pot gardeners, home gardeners and community gardeners – participants were recruited for in-depth interviews, as well as for a short planting activity within the pot gardening and home gardening segment. Throughout the activities and interviews, ethical considerations were considered.

Resulting from the interviews, data on the participants' sex, age, living situation, interests and their gardens could be gathered, including the key factors contributing towards their gardening experiences within a social context. The general information gathered on the target group of gardeners within different segments will help us consider the context of gardeners and their intrinsic characteristics while designing for this group. The experiences of gardeners are further analysed within the Analysis section.

4.1 Participant selection

The selection of participants in this project aimed at the exploration of social interactions within the gardening context and their effect on well-being. Therefore, participants were selected from three identified groups: **pot gardeners, home gardeners and community gardeners.** This selection was created through a combination of a pre-study in form of a short online survey via Google Forms, where the category of gardening individuals participate in and their social potential of their category was inquired about (see Appendix B), and desktop research.

The survey contained several aspects, including age and occupational status. Inquiry was done on gardening interests and the ownership status of their plants. Furthermore, participants were asked whether they engaged in gardening activities with friends and family, either jointly caring for plants or assisting others in their gardening activities. Participants were questioned about their regular involvement in plant care for themselves or perhaps for someone else.

Towards the end of the survey, inquiry was done in the form of an open-ended question to encourage participants to share about their personal experiences related to gardening and its role in their lives. For individuals who did not partake in gardening, the question covered asking for the reason for this, allowing us to get insights into the perspective of non-gardeners as well, to discover if there is potential in design solutions within this group of people.

The results of the survey, together with the performed desktop research, provided us with insights into the different types of gardeners and their gardening practices. In particular the open-ended question at the end of the questionnaire allowed participants to share what they deem essential about their gardening experiences.

Out of the 44 participants of the survey, the majority, compromising of 37 participants, were 18 to 39 years old. The survey yielded that the individuals who participated in the survey consisted primarily of students. The survey showcased a variety of gardening practices among participants, including the result that they either own their plants in a private garden, in pots around the house or in a community managed garden. There were also participants which did not own plants.

The survey revealed that more than half of the participants actively help another person with their plants and take care of plants on a regular basis.

From the open questions it could be derived that the majority of pot gardeners do not

prefer to put a lot of effort into the act on gardening and would prefer to focus on giving water on a regular basis instead, doing minimum tasks to keep their plants alive. They claim to research how to take care of plants when necessary, but otherwise would not put more effort into taking care of them as they did not prioritize extensive plant care. In contrast, other participants showed eagerness into taking care of their plants, unrelated to whether they are planted in a garden or pots, as the plants bring them happiness. Some participants have plants but felt the emotional responsibility of having to take care of them, as they received them as gifts from friends. Answers also revealed that some participants show interest in plants after being exposed to them. They then tend to look up the plant to discover what it is and how they might take care of it. Online resources, such as Google, WikiHow and YouTube often seem to be used to inquire about gardening questions and tips, along with apps such as Planta and PlantNet which are used for gathering information on plants. Many claim to have gathered experience over the years from taking care of plants becoming adept at plant care, while others reveal that they have plants for the purpose of being aesthetically pleasing and preferred minimal involvement in the care of their plants.

These results provided insights and understanding of the target group of gardeners and their different styles, as well as values within the act of gardening. It yielded and confirmed that there are three different groups of gardeners, differentiated by the style of keeping their plants; either in **pots, a private garden or a community garden**. A summary of the responses can be found in Appendix C.

4.2 Interview participants

For the interviews, deliberate choices were made towards the selection of participants, especially concerning the pot gardeners and home gardeners. These different selections are explained in the following.

4.2.1 Pot gardeners

Considering the scope of this project of aiming to enhance well-being through facilitating a social bond between gardeners and taking into mind that pot gardening is an activity which is commonly performed alone, a deliberate choice was made to recruit friends as participants for interviewing. With friends, there is an established close social relationship between researcher and participant, which creates a more comfortable environment for performing an activity and discussing openly, as well as incorporates the social focus of this project.

4.2.2 Home gardeners

Even though most home gardeners commonly live together with other tenants, to shed light on how they experience gardening, an approach similar to those of pot gardeners was adopted to this segment of gardeners. Through recruiting friends for this segment as well, the influence of social relationships within the context of gardening at home could be explored.

4.2.3 Community gardeners

Different from the other two segments, due to the unique nature of community gardening where an established social network is present within every participant of the community garden, participants from a community garden were recruited through a board member of the community garden Delftse Hout. Characteristic for the community garden Delftse Hout is their community cabin "De Viersprong" (Figure 9)

Figure 9 - Community cabin De Viersprong in gardening complex Delftse Hout.

and their structured garden layout, as portrayed on pin boards throughout the garden complex (Figure 10).

Figure 10 - Pinboard with important information and map of gardening complex Delftse Hout.

4.3 Interviews

For each of the different identified groups, data collection was guided by different approaches. To explore the network of gardening activities, social interactions, and well-being, while community gardeners experiences were mainly gathered through in-depth interviews and a tour through their garden, pot gardeners and home gardeners experiences were gathered through in-depth interviews, accompanied by a collaborative planting activity, where reflection on emotions during the experience was key in a closing reflective session (Figure 11).

4.3.1 Interview questions

The in-depth interviews were guided by a set of semi-structured questions designed to explore the participants' experiences and challenges related to gardening and well-being. The questions consisted of open-ended questions, based on what was found during literature review and on the research objective of this project. The questions which were asked to pot and home gardeners differed slightly from community gardeners, due to the different context of these interviews. Some of the questions towards pot and home gardeners were focusedcoll on whether they would even desire to engage in social gardening at all. However, in total, all questions were focused on the experience of gardening, specifically how individuals

experienced gardening alone, as well as how they experienced gardening in a social context. Based on the provided answers from participants, follow-up questions were asked to dive deeper into the motives as well as emotions felt in the context of gardening. The PrEmo tool (Desmet, 2019) was utilized for questions relating to emotions, to serve as a support for defining emotions that are experienced during gardening activities.

During the interviews general questions about the participant in form of age, occupation and hobbies were inquired about. General questions about gardening were asked, such as how often do you garden and how long does such a session last, what do you like and dislike about gardening and what are motivations behind gardening. These questions were followed up through questions about the gardening experience itself, such as how long does gardening normally last, when do you decide to garden and how do you feel during gardening. To touch more upon the social aspect of gardening, questions were asked about the gardening experience in relation to social companionship during gardening. Inquiry was done on whether gardeners garden together, and if they ever get into conflict about gardening topics. Also questions about sharing about garden experiences was inquired about. Finally, questions about the tools that are being used within the gardening experience were asked, such as what tools are being used and are

Figure 11 - Collection of images from collaborative activity with home gardener.

there tools which are especially preferred to be used.

For the pot gardeners and home gardeners, additionally the reflective session was guided by asking questions in the moment about how they experienced the shared gardening activity, and how they felt about another individual being involved during the activity.

The full lists of interview questions, together with the PrEmo tool can be found in Appendix D (in Dutch).

Answers to these questions were noted down in shortened form, as well as observations and notes were documented on the side.

4.3.2 Ethical considerations
Ethical considerations were subject during the research process. During the project, Informed Consent was obtained from interview participants in which the purpose of the study, the voluntary nature of their participation and the assurance to anonymity and confidentiality was explained. Participant privacy and well-being were consistently prioritized and sensitive data shared during the interviews was treated with respect. The form which was used to obtain Informed Consent can be found in Appendix E.

4.4 Results
For this project, in total, 11 in-depth interviews were conducted: 2 interviews with pot gardeners, 1 with home gardeners and 8 with community gardeners. General information was gathered during these interviews, concerning their age, sex, living situation, interests and the style of their garden. The detailed information and answers of each interview can be found in Appendix F.

4.4.1 Age, sex & living situation
Pot gardeners
The average age of the two pot gardeners was 25 at the time of this project. Both are students and female, who live temporarily at their current housing in the Netherlands.

Home gardener
The age of the home gardener was 28 at the time of this project. She identified as female and currently shares her home and garden with her older brother.

Community gardeners
From the community gardeners, 7 participants had their gardening plot located in the gardening complex Delftse Hout in Delft while 1 interview duo had their garden located in a smaller gardening plot in Delft. The latter was the only interview which was held with 2 people answering questions simultaneously.

From the data that was made available by the participants, the average age of the community gardeners was determined to be about 50 and the majority identified as female, with 6 females and 3 males. The youngest gardeners were about 20 while the eldest gardeners were in their 60s.

4.4.2 Interests
In their free time, next to gardening, the interviewed gardeners from all segments like to be spend time on physical activities, as well as a balance between social engagement and individual relaxation. Participants mentioned they enjoyed participating in sport activities such as hiking, rowing, sailing, hiking, archery, cycling and winter sports, but also relaxing activities such as playing chess, reading, drawing, cooking, crafting, listening to music, solving puzzles and watching movies. They also enjoy to participate in social activities where talking and meeting up with people stands in the foreground.

4.4.3 The gardens
The "gardens" in which pot gardeners, home gardeners and community gardeners perform gardening differ greatly.

Pot gardeners

Figure 12 - Display of plants owned by a pot gardener.

While the display of the "garden" of pot gardeners has been observed to mainly takes place on shelves, windowsills and balconies, the gardening activity often happens on a table, the floor or balconies, on surfaces which are easy to clean afterwards (Figure 12). The amount of plants varies according to the available space inside the living environment and the effort that pot gardeners desire to put into the plants.

Home gardeners

Home gardeners are bound to the garden attached to their living environment, which can differ greatly in size. From observations, as well as from the interview, it can be derived that often, these gardens are shielded from others people's view by fences and hedges to ensure a degree of privacy within the garden. The interior of the gardens are completely freely designable by the home owner, where the only limitation is presented by common law. An example of such a garden can be found in Figure 13.

Figure 13 - Garden of a home gardener.

Community gardeners

For community gardeners, the garden available to them varies depending on the location. In the Delftse Hout, community gardeners each have a contract for a garden space, where they have about 250m² allocated to them, including a small cabin within the garden, while the interview duo at the smaller gardening complex have a working space of approximately 6m². The interviews and observations revealed that each community gardener exhibits a different gardening style. Some gardeners prefer to keep their garden neatly organized and kept with little to no weeds growing amongst their plants to provide optimal plant growth for desired plants, while others will let every plant that comes up by itself grow to discover what it is and later on decide spontaneously whether to discard of it. Some gardeners make use of the garden inside the complex as a relaxing space to invite friends and family over (Figure 14).
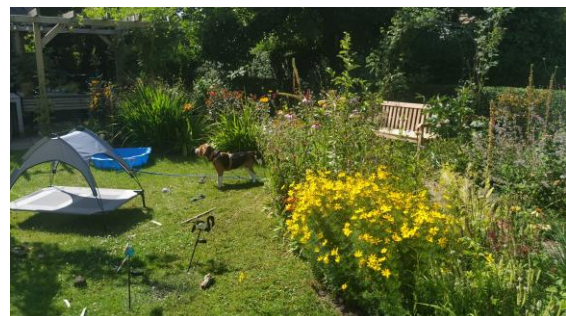
Figure 14 - Community gardens focused on relaxing.

For this they focus on growing large grass fields with seating areas distributed over it, while also growing larger plants along the sides of their garden. Some gardeners use their creativity and limited or cheap resources they find inside the garden to craft different

Figure 15 - Community garden using plastic bags as scarecrows.

supports for their plants, such as scarecrows from empty water bottles, vine aids from leftover wood and sticks, and potato patches from old dirt bags (Figure 15). Most of the gardeners have tools present within their garden (Figure 16). A rule within the community garden inside the Delftse Hout, is that gardeners are required to keep their hedge at a height of 1.5m to ensure oversight over gardens for visitors.

4.5 Conclusion

These results provide an intricate picture of the general conditions of gardeners and shows us what the characteristics of gardeners are, as well as the context in which gardening is performed. Further analysis will be done on the experience that could be gathered from these interviews and activities and the dilemmas that emerge from these results.
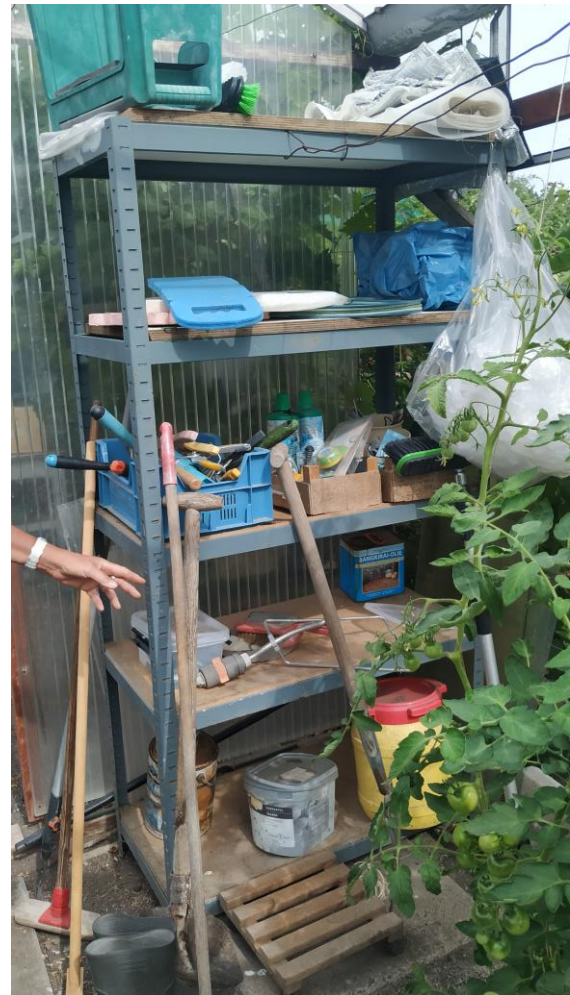
Figure 16 - Community garden with tool storage inside their greenhouse.

5. ANALYSIS

5. ANALYSIS

A systematic approach was used to derive insights from the gathered information during data collection. The data analysis consists of several stages, each designed to categorize and interpret the qualitative data effectively.

The data analysis was guided by the methodology of thematic analysis (Braun & Clarke, 2012). Due to its flexible nature, thematic analysis allowed us to systematically identify themes which are relevant for the research question from the collected data and enabled us to find either patterns across the dataset or dive deeply into specific phenomena of interest.

During this analysis, we looked at inductive thematic analysis, allowing themes to naturally emerge from the dataset. This inductive approach provided us with the possibility to develop themes that aligned with understanding the fundamental connections of what gardening means to gardeners, as well as identifying areas that touch upon well-being. While keeping the research question in mind, thematic analysis provided the flexibility for interpretation, ensuring that the analysis is both data-driven, as well as conductive to exploring the relationship between gardening, well-being and design.

5.1. Clustering of statements

At the start of the analysis, all relevant quotes from the interviews were transcribed and organized onto individual statement cards.

In total, 531 statement cards were derived from the interviews with the pot gardeners, the home gardener and the community gardeners. These statement cards contain statements in form of answers to the questions that were asked during the interviews as well as shared thoughts which came up in conversation about gardening. The cards are colour coded by interview. All statement cards can be found in Appendix H.

5.1.1 Goal assignment

Each statement was analysed to identify the underlying goal of the statement, based on the 24 Universal Human Goals as defined by Ford and Nichols (1992) provided through an infographic provided by Deger Ozkaramanli (2018) (see Appendix G). This was implemented to discover the motivations and aspirations associated with the gardening experience of every participant. Examples of these statement cards can be found in Figure 17.

5.1.2 Clustering by common topics
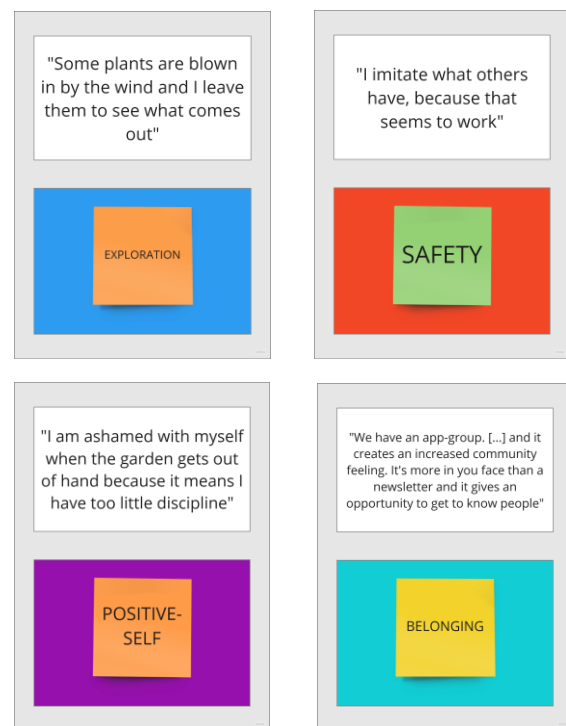
Figure 17 - Examples of statement cards. The colour of the card corresponds to the interviewed participant, while the different coloured post-it squares represent the 24 Universal Human Goals.

Following the assignment of goals to each of the statements, we were guided by thematic analysis to classify the statements based on the recurring topics amongst the provided data. The aim of this thematization was to highlight common topics within the participants' responses and to facilitate the identification of meaningful patterns among the data set. Therefore, after organizing the

statements of each interview thematically, a cross-combination of topics across all interviews with each of the corresponding statements was performed to gain an overview of common occurrences among the participants (Figure 18).
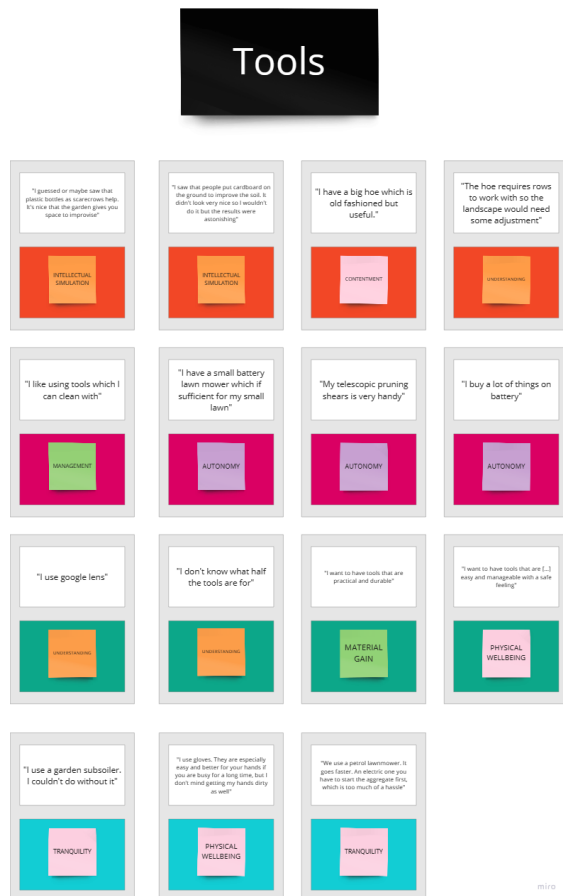
Figure 18 - Example of clustering statements of different interviews by topic.

Topics

Through the thematic analysis, the 531 statement cards could be categorized in 9 topics. These 9 topics are explained in the following:

1.   Individuality

Focus on personal needs and desires in gardening, emphasizing on self-centeredness in the gardening activity.

2.   Activity

The aspects of physical activity, including actions that are desired to be achieved within the garden context.

3.   Outdoor experience

The connection to nature while gardening, highlighting the importance of the natural environment to the gardener, as well as what is desired from nature.

4.   Reflection

Looking back on gardening experiences, considering achieved goals, as well as those which are still in pursuit.

5.   Time

The perception of time constraints and its influence on gardening and personal time-related desires in the garden.

6.   Community

The role of gardening within a community, including expectations from other gardeners, the considerations on how you are perceived yourself by other gardeners and the general social aspects which contribute to gardening inside a community.

7.   Management

Interactions with administrative boards in community gardening and expectations from this authoritative structure.

8.   Planning

Structuring the gardening activities, looking at future plans and general preparations for gardening.

9.   Tools

How tools impact and contribute to gardening and its experiences. It involves the significance and personal preferences regarding the use of tools.

The choice to follow inductive thematic analysis and cluster by emerging topics was made, as gardeners might have similar goals within different topics, but not all common goals which were assigned to the statement cards are necessarily about the same topic. Therefore, to establish within which topics or

what different topics would cause gardeners to feel conflicted, the deliberate choice was made to develop topics. Is it for example the focus on the gardening activity itself that hinders achieving an integrated community feeling, while the same goal is aimed for? Or could it be an issue within an activity that could cause feelings of conflict because two goals that are desired to be achieved within the gardening activity cannot simultaneously be achieved? Clustering by topics would help create overview of the context of where dilemmas would be conflicting and helps in providing increased overview of the emergence of potential dilemmas.

5.1.3 Deriving sub-themes – overarching goals

Within these larger clusters of common topics, sub-themes in form of overarching goals were derived, where statements from gardeners with similar end-goals were clustered within each topic (Figure 19). This synthesis of statements within a topic made an insight into consistent occurrences of dilemmas which might emerge across different participants with the same end-goal possible.
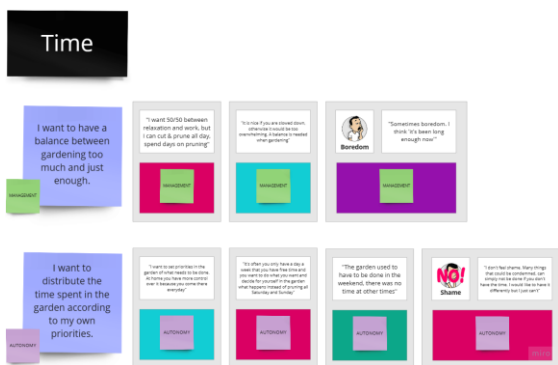
Figure 19 - Example of sub-themes in form of overarching goals for clustered statement cards within the topic "Time".

Within these 9 topics, 75 sub-themes or overarching goals could be defined (as can be seen by the example in Figure X). These sub-themes were derived through the summary of sub-themes amongst a topic and the goals that are common among the topic. Each sub-theme was defined as a concise statement in

the format of "I want to […]". A comprehensive list of the sub-themes can be found in Appendix H.

5.1.4 Deriving dilemmas

In line with the principles of "Dilemma-Driven Design", the identification of dilemmas is relevant. For this, each defined overarching goal was scrutinized and compared with other goals to discover potential conflicts with these said other goals (Figure 20).

During the creation of dilemmas, first ideas were documented simultaneously, to assist with the selection of a dilemma that would

behind the dilemma.

inspire ideas contributing to subjective well-being.

In total 28 dilemmas were identified from cross-combining the overarching goals within each topic.

5.2 Defining dilemmas

From the identified dilemmas, 10 dilemmas were selected which did not only spark the most inspiration for designs aiming at enhancing well-being, but also portrayed highest relevance for future users.
The focus of these 10 most inspiring dilemmas all lay within the context of the community garden and cover different fields of the topics.

These 10 dilemmas are:
1. I want to do what I want when I want and only consider my own needs, but I also want to be social by helping and interacting with other, creating social connections.
2. I want to have what others have because they are successful, but I also want to be unique and successful.

3. I want to have imperfections inside my garden to be able to enjoy it, but I also want my garden to be flawless to be able to enjoy it.
4. I want to let the garden grow by itself and be surprised by what it has to offer, but I also want to be satisfied with myself when looking back on what I have achieved inside the garden.
5. I want to have more space to garden so I can garden more, but I also want to have a balance between gardening too much and just enough.
6. I want to take time to experience and enjoy the natural processes inside the garden, but I also want to be time efficient so I can do other activities (inside the garden).
7. I want to try new things & experiment inside my garden, but I also want to be successful in gardening.
8. I want to be able to experience a fresh place outside of my usual home environment, but I also want to expand my gardening experience outside of the location of the community garden.
9. I want to receive help from fellow gardeners, but I also want to keep a positive self-image with my garden.
10. I want to feel admired because people like what I am doing, but I also want to be humble about my gardening achievements.

A more detailed explanation of these 10 dilemmas can be found in Appendix I.

These 10 dilemmas offered the starting point for idea generation.

6. IDEATION

6. IDEATION

The ideation phase consists of 5 distinguished, different steps, combining ideation with iteration, diverging and converging through different ideation methods. While 4 of the 5 steps (1, 3, 4 & 5) are focussed on idea and concept generation, step 2 is focussed on narrowing down the scope of the project by selecting dilemmas that seem to be most inspiring and promising to narrow down the scope further after initial idea generation.

The process of working with identified dilemmas as a central component to the research methodology is outlined in this section. The identified dilemmas serve as the foundation to idea generation, as every ideation method aims to contribute to respond to the dilemma in different ways. Facilitating different design methods, including brainstorming and designing through analogies, helps open up the creative space to address the dilemmas in different ways, each aiming to enable a wide span of ideas to emerge. Through increased potential in ideas, we widened the scope to achieve the goal to create designs which fit within the principles of Positive Design, aiming to discover the potential to contribute to human flourishing.

6.1 Step 1: Structured ideation – Ideas for each response to a dilemma

To initiate the idea generation process, a first step involved constructing a grid where each defined dilemma from the subset was recorded. The grid was divided into sections, each allocated for either solving, mitigating or triggering the dilemmas with potential solutions. Within these spaces, ideas were systematically generated.

The 10 dilemmas which were chosen as most inspiring, were noted down in the grid, providing the structured framework for addressing the dilemmas. It facilitated the start of generating different ideas, as it aimed

to focus not only solving the dilemma, but also on the possibility of triggering or mitigating the dilemma, prioritizing one concern over the other. Overall, the grid would provide clarity regarding which dilemma sparked most inspiration, evident through the quantity of ideas generated for each dilemma.

As a result from this method for example, while the dilemma "I want to have more space to garden so I can garden more, but I also want to have a balance between gardening too much and just enough" allowed the generation of 2 initial ideas in total, the dilemma "I want to take time to experience and enjoy the natural processes inside the garden, but I also want to be time efficient so I can do other activities (inside the garden)" sparked a total of 8 initial ideas, facilitating the fact that this dilemma provided more room for inspiration (Figure 21).

The idea grid strategy helped in the evaluation of the dilemmas, as the volume of generated ideas could indicate the creative potential each dilemma conceived. Based on the results from the grid, as well as through personal assessment of these dilemmas, four dilemmas emerged as particularly inspiring for the development of future design directions and were therefore chosen as key dilemmas to continue idea generation with.

All ideas generated in the first idea generation process can be found in Appendix J.
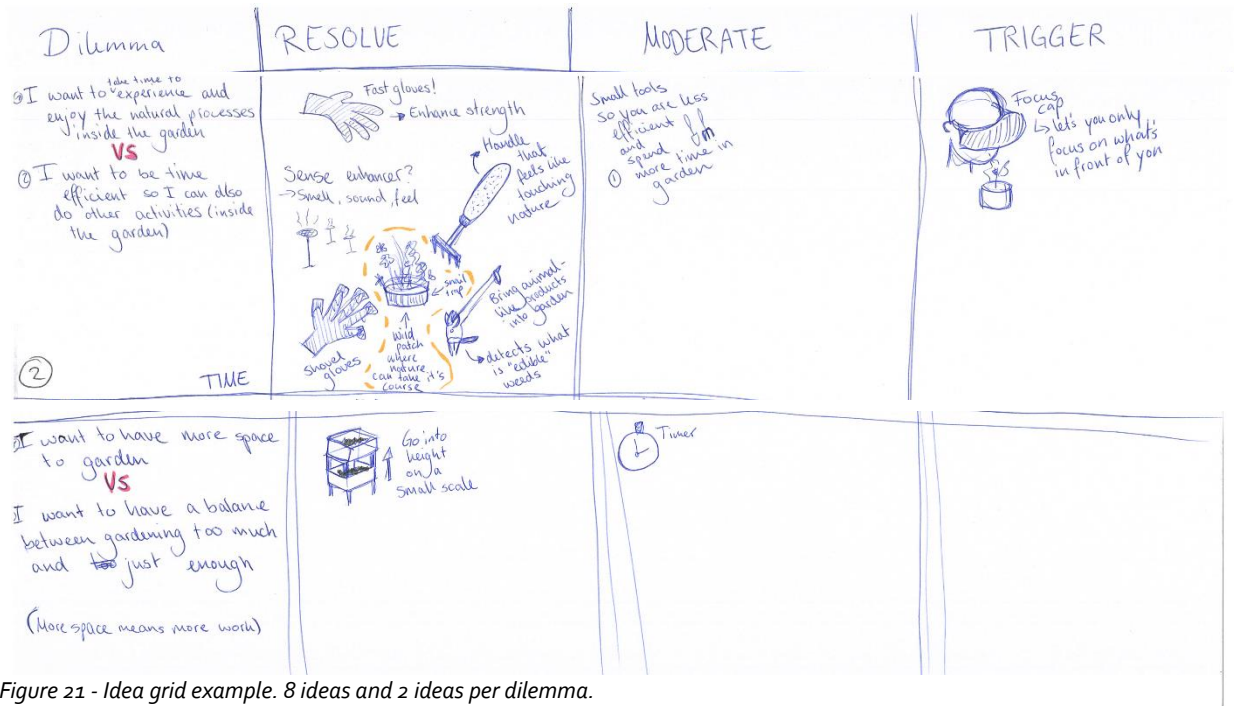
Figure 21 - Idea grid example. 8 ideas and 2 ideas per dilemma.

6.2 Step 2: Mapping the 4 chosen dilemmas

To deepen the understanding of the four selected inspirational dilemmas, the dilemma mapping tool developed by Deger Ozkaramanli (2018) was used. Through mapping these dilemmas, we were able to define conflicting goals, concerns and mixed emotions, derived from the interviews and defined based on the 24 Universal Human Goals (Ford, 1992) and the Emotiontypology ("Home - Emotion Typology," n.d.). Additionally, it leveraged generating potential choices corresponding to each of the opposing concerns.

This overview of the dilemmas served as a tool for multiple purposes. Not only did mapping the conflicts provide visual clarity of opposing concerns, it also aided in enhancing the understanding of the complex issues gardeners face while gardening. It provided support in the generation of creative ideas, as it breaks down the complex issues into its elements and provided us insights into the users' needs and preferences, helping us to create designs that align with the users' values and motivations. Due to the inherent trait of the mapping tool being simply

structured, while providing a clear overview, it was also utilized as documentation purposes for future reference and communication of the chosen dilemmas.

These four dilemmas, are mapped out into a simplified version of the dilemma mapping tool and serve as a foundation to the design exploration. The mapping tool is simplified, where the star symbolizes the opposing goals of the gardener, the text bubbles express their concerns, the happy smileys symbolize the gain from each concern and the sad smileys the pain if the concern is fulfilled but the opposing concern gets neglected. At the bottom through the "I could…" statement, the possible actions within each concern are indicated (Figure 22).
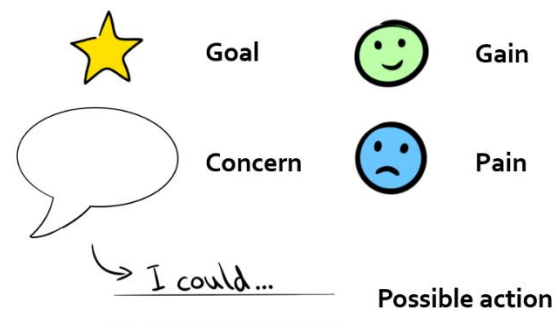
Figure 22 - Explanation symbols of Mapping Tool schematics.

The four chosen dilemmas are explained in the following.

6.2.1 Dilemma 1 - Community vs Individuality

I want to have what others have because they are successful, but I also want to be unique and successful.
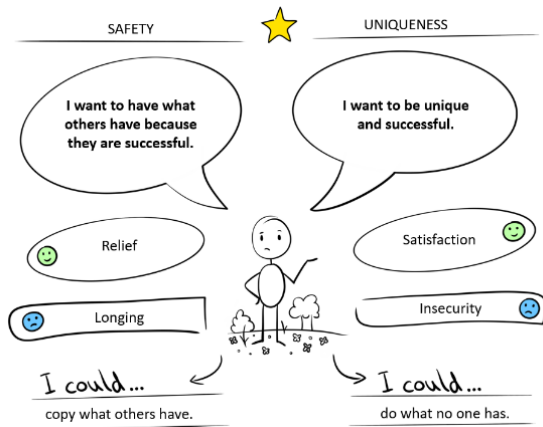
Figure 23 - Mapping Dilemma 1 - I want to have what others have because they are successful, but I also want to be unique and successful.

For Dilemma 1, being successful stands in the foreground. The interpersonal aspect of individuality here clashes with the intrapersonal aspect of community. Having examples inside the garden of people being successful creates the desire for gardeners to be as successful as them. However, next to this goal of safety, which indicates that humans prefer to be in control in order to prevent them from harm, gardeners do want to remain unique, defined as being special or different, preventing to be similar to others, and having their own set of plants while also being successful.

From the interviews, it could be derived that it would make them feel relieved if they are able to be successful just like others are, but while doing so they would remain longing to be unique. On the other hand, participants expressed they would feel satisfied if they could stick to their own compositions and be unique, but also feel insecure as it is uncertain whether they will successful while remaining unique.

Corresponding actions they could take are either copying what others have to be successful like others or do what no one has done before to remain unique (Figure 23).

6.2.2 Dilemma 2 – Outdoor experience vs Time

I want to take time to experience and enjoy the natural processes inside the garden, but I also want to be time efficient so I can do other activities.
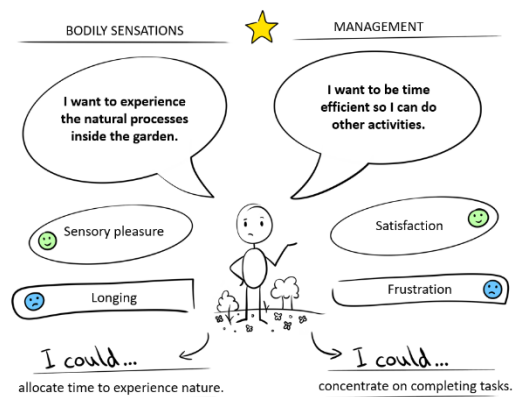
Figure 24 - Mapping Dilemma 2 - I want to take time to experience and enjoy the natural processes inside the garden, but I also want to be time efficient so I can do other activities.

Dilemma 2 focusses on the interplay between the outdoor experience and the constraint of time within the gardening context. Gardeners want the opportunity to be able to experience nature and what is happening inside of the garden, while simultaneously being time efficient so they can perform other activities next to gardening itself. Yet, the interviews revealed that gardeners often find themselves with limited time for taking care of their garden and experience pressure to keep their gardens up to predefined standards. On one hand, there's the goal of management, where emphasis is put on being productive and organized. On the other hand, participants showed that they do not only desire time efficiency. The goal of experiencing bodily sensations is present, as participants revealed that they desire to take the time to engage their senses and absorb the natural world.

Gardeners gain sensory pleasure from being able to experience bodily sensations, but feel

longing towards completing their tasks inside the garden, which they would achieve when being time efficient. However, when they do achieve said time efficiency, they claim to be satisfied with achieving their gardening goals, but this is accompanied by frustration since this means they are unable to mindfully engage with the natural processes unfolding within their environment.

In response to the concerns, two possible actions could be that gardeners either allocate time to experiencing nature within their garden or they can opt to concentrate on completing tasks inside the garden (Figure 24).

6.2.3 Dilemma 3 – Community vs Reflection

I want to feel admired because people like what I am doing, but I also want to be humble about my gardening achievements.
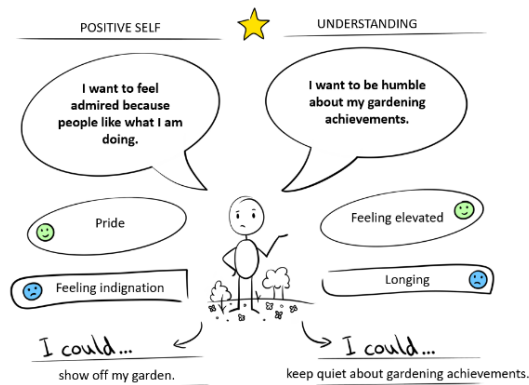
Figure 25 - Mapping Dilemma 3 - I want to feel admired because people like what I am doing, but I also want to be humble about my gardening achievements.

Dilemma 3 is about the balance between aspects of community and reflection. On one side, there is the aspiration to be acknowledged and admired by other gardeners within the community for their achievements within the garden, leading to a sense of pride. On the other side, there is a focus within gardeners towards modesty in the face of their accomplishments. Gardeners often show the desire to remain humble and unassuming about their achievements, refraining from boasting to avoid a negative image. In both cases, the underlying objective

is to nurture a positive-self, fostering self-confidence, as well as self-worth.

Being humble about achievements gives rise to feelings of elevation, as gardeners refrain from showing others their abilities. However, while doing so, they do remain longing for the admiration from their fellow gardeners to boost their self-confidence. Contrarily, aiming to be admired can lead to inner conflict. Acting immodest may collide with their own personal moral values, potentially causing a sense of resentment towards themselves for neglecting the principle of humility.

Possible actions gardeners could take to fulfil each concern, are either showcasing their garden with the aim to gain admiration or maintaining a discreet demeanour towards their gardening achievement, upholding their sense of modesty, all the while hoping that their efforts will earn the recognition they deserve by themselves (Figure 25).

6.2.4 Dilemma 4 – Community vs Community

I want to receive help from fellow gardeners, but I also want to keep a positive self-image.
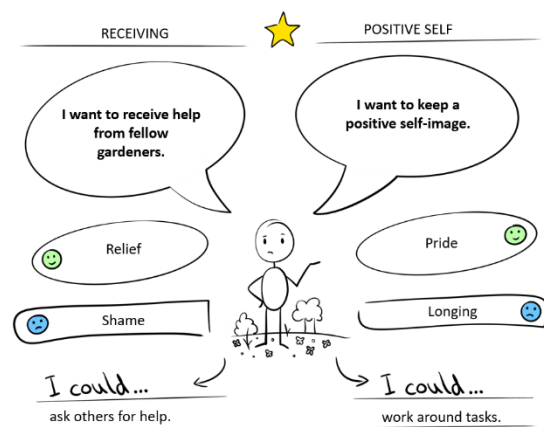
Figure 26 - Mapping Dilemma 4 - I want to receive help from fellow gardeners, but I also want to keep a positive self-image.

For Dilemma 4, communal aspects collide within the gardening community. Gardeners have the desire to receive help from fellow gardeners, often because physical tasks exceed their individual capabilities. However,

they are reluctant to directly ask others for help, as they want to maintain a positive self-image. This self-image depends on avoiding the appearance of helplessness or inability to successfully complete tasks autonomously, which is important for maintaining their self-worth. All the while, they do have the goal of being receiving, as they desire assistance from others to be part of the social circle.

When gardeners obtain the help they need, they experience a sense of relief, as a burdensome task has been successfully accomplished, permitting them to resume their gardening activities. However, this achievement comes at the cost of feeling shame; the act of seeking help exposes a vulnerability as they appear incapable of fulfilling their own tasks. On the other hand, maintaining a positive self-image by refraining from asking for assistance provides gardeners with a sense of pride, since they are able to show their autonomy. Yet, within this appearance of self-reliance, they still long to be helped by fellow gardeners.

To fulfil the concern of receiving help, gardeners could approach other gardeners to ask them for assistance. To keep a positive self-image, gardeners could work around the task which they are trying to solve, so they would require help anymore or leave the task unsolved (Figure 26).

6.2.5 Conclusion
Through defining these dilemmas, further idea generation corresponding to each dilemma could be implemented. Providing an increased understanding and overview of the dilemma, including what gardeners could potentially do if the opposing concern would not be present and what goals and emotions is stopping them from reaching their goals within a certain context, contributed as a base to further idea generation.

6.3 Step 3: Brainstorming through mind mapping – What other ideas are there?
To continue idea generation, for these selected, refined dilemmas, a more open and flexible approach was adopted. While noting
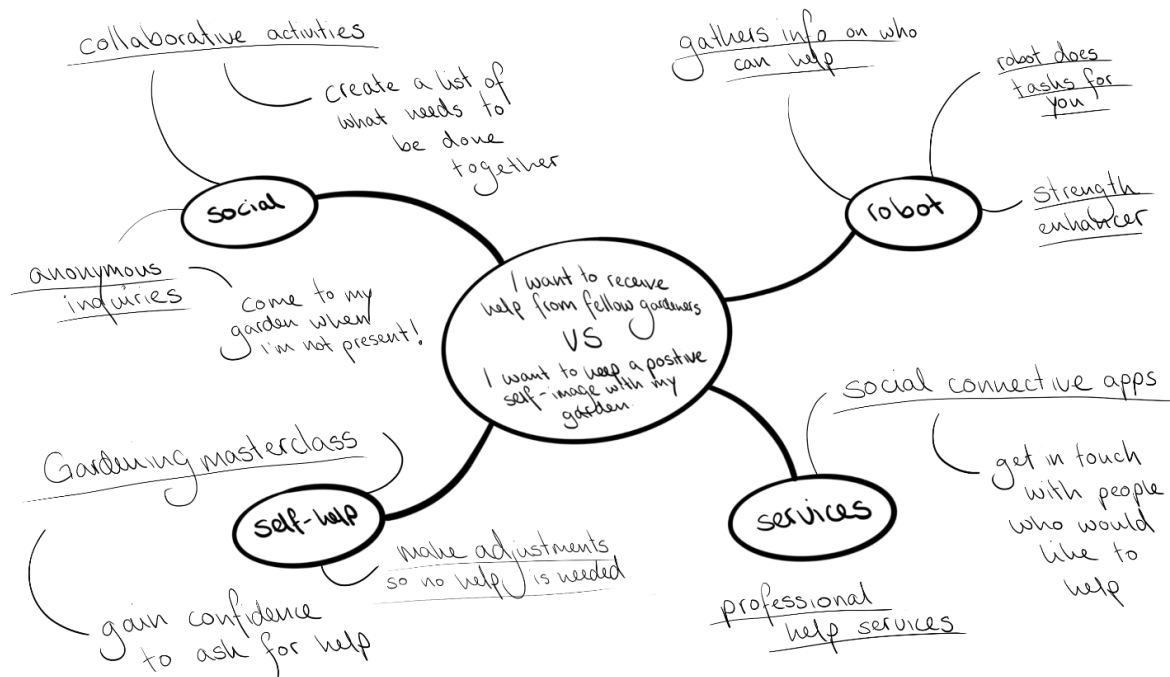
Figure 27 - Brainstorm results mind map - Dilemma 4

down ideas within a grid allowed us to generate ideas for each possible response to a dilemma, the brainstorming approach allowed us to shift away from the mental constraints of categorizing designs as either a solution, moderation or trigger to a dilemma, while still keeping the dilemma as the foundation to the idea generation.

Brainstorming sessions were held for each of the narrowed down dilemmas. During those brainstorming sessions, ideas were recorded within a mind-map (Figure 27). During the creation of these ideas, the deliberate choice was made to create ideas free from considerations of well-being, to open up the creative space and emphasize idea generation. Later on these ideas would be synthesized and iterated on to reestablish the contribution to human well-being.

From the brainstorming sessions ideas such as robots which would perform tasks on behalf of the gardener for Dilemma 1, as well as long-term self-help solutions in forms of gardening masterclasses were thought of during this process in relation to the dilemma.

The results of the brainstorming session for Dilemma 4 is presented below. The brainstorming session results from Dilemma 1, 2 and 3 can be found in Appendix K.

When brainstorming solutions, triggers and moderations for a dilemma in the form of words, four directions to address these dilemmas seemed to emerge. Ideas were categorized in either being a "social" response for the dilemma where the involvement of fellow gardeners is key, a "self-help" approach where the gardener autonomously would be the mediator to responding to the dilemma, a "robot" response involving the application of technology to assist in addressing the dilemma, and a "service" solution where external entities outside of the garden would help you in providing a response to the dilemma.

These categorizations showed in what direction diverse ideas could go when considering dilemmas as the main input for creating design. The ideas developed during this session served as support for further iteration in the later stage of this project.

6.4 Step 4: Nature analogies – Establish a closer relation to nature – consider the context

To further foster creativity and overcome potential design fixation which might have resulted from the initial idea generation session using the grid and mind map, for example through the different categorizations, inspiration was sought from analogies within nature (Smith & Linsey, 2011). Since key to a gardeners environment is nature, this method was approached through going into nature and taking inspiration from the environment that could be observed. The community garden Vijvertuinen, which includes a pond (Figure 28) served as the key environment for this idea generation process, since the ideas were generated within this space.

Figure 28 - Community garden Vijvertuinen.

This approach helped stimulate idea generation which fosters to a gardeners environment and context. It served as an ideation method which would provide an increased connection to the gardening context, as it would provide a possible enhanced feeling of connection to nature and harmony within this context, which could have gotten lost during the earlier idea generation. Similar to the brainstorming process however, the initial considerations whether the design should solve, moderate or

trigger the dilemma were set aside, albeit the dilemma would still remain key to the to be generated ideas.

While the grid and mind map ideation were focused on creating ideas for possible products, shifting away from this focus, the analogies generated and captured during this session provided insights into the natural world and how we could translate the characteristics of it into potential design solutions, as we explored how acts in nature could address dilemmas similarly.

Here as well, the result for Dilemma 4 are shown in Figure 29, while the results for Dilemma 1, 2 and 3 can be found in Appendix K.

The ideas should be regarded as nature-inspired abstractions, offering inspiration from natural phenomena rather than direct product solutions which solve, moderate or trigger the dilemma.

For example, in nature it is self-evident behaviour for birds to call out if there is danger present. Drawing from this natural phenomenon, one example of an analogy that can be made, is the idea to include an alternative entity which would automatically communicate the need for help. With this, the need to ask for assistance personally would be eliminated, as the external entity would support you in receiving the needed help.

Another example involves using elements to convey the need for assistance. Elements in the environment, such as slowly increasing waves or the wind, could serve as non-verbal signals, indicating that there is a change in circumstances and the need for assistance is present. This indirect communication would bypass the face-to-face interaction which has been argued to be a key obstacle in the process of seeking assistance, as if often involves revealing vulnerability.
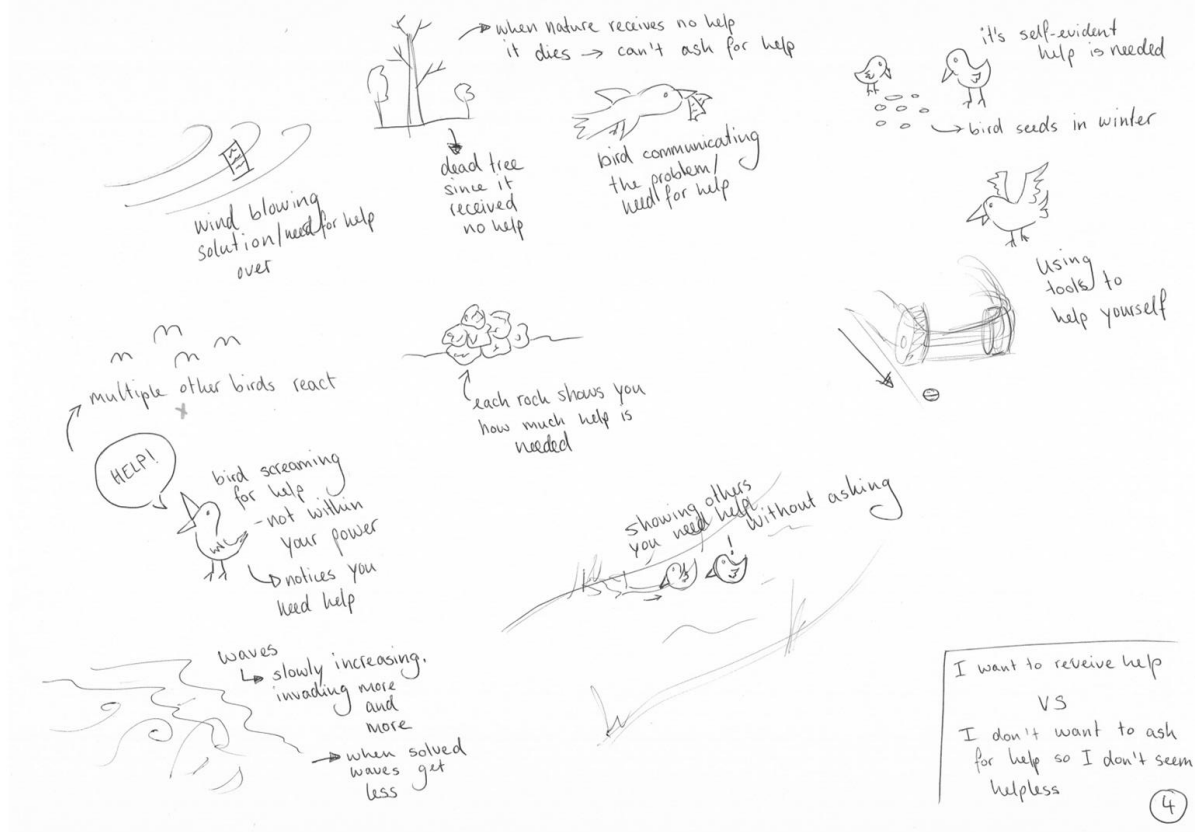
Figure 29 - Nature analogies for Dilemma 4

This approach allowed us to combine creativity with novel thinking into the design process, making the exploration of unique and innovative directions for dealing with the identified dilemmas possible while not yet thinking of concrete product responses to the dilemma. Similarly to the grid and mind-map results, these abstract and symbolic ideas were used as inspiration for design ideas during the synthesis of all generated ideas.

6.5 Step 5: Synthesis of ideas – What concepts can we create from the ideation steps?

As a result from the ideation methods, the generated ideas from steps 1, 3 and 4 were gathered and synthesized, leading to the development of tangible ideas that are more practically viable and amenable for further product development.

During the synthesis and iteration phase, the generated ideas varied in their focus, as can be seen in Figure 30.

While some ideas were focused on tangible tools, such as gloves designed to enhance sensory experiences, addressing Dilemma 2 where they would support the gardener in improving efficiency in gardening while enabling a deeper connection to nature, other ideas were exceedingly technologically oriented. One idea generated during this phase for example, is the concept of a companion robot, designed to address Dilemma 3 where gardeners are hesitant to seek approval of other gardeners, yet still desire their recognition. The robot would offer compliments to gardeners for their accomplishments, which could highlight the loss of value associated with pre-programmed compliments when compared to genuine human-to-human interactions. This idea combined the idea of a robot responding to the dilemma for you, conceived during the mind-mapping process and the nature analogy of a bird requesting help for you, taking the power of requesting help yourself out of your hands.

Figure 30 - Synthesis of ideas resulting from the earlier ideation methods.

These ideas generated during the synthesis, incorporating all previous steps of idea generation, provided the foundation for concept creation.

7. THREE CONCEPTS & CONCEPT CHOICE

7. THREE CONCEPTS & CONCEPT CHOICE

To maintain a manageable scope for further evaluation and refinement, three concepts which resulted from the final ideation step were chosen and refined. These concepts which were developed from the synthesis of ideas, each solve a different dilemma.

7.1 Three concepts

7.1.1 Concept 1 – Mix and match

Concept 1 is designed to address Dilemma 1, where gardeners strive to be unique and successful but also desire to possess what others have, as it is evident that these people are successful. The idea behind Concept 1 (Figure 31) is to offer a service in form of for example an app, where gardeners receive access to a database of compositions of plants created by other gardeners who are successful.

Gardeners could use this service to select plants from existing compositions to create their own unique set of plants. While the individual plants from the existing compositions may not be unique in itself, the overall combination of plants would make the garden different from others. Through this

concept, a balance is achieved for gardeners, where they can realize their own unique garden compositions, while profiting from the guaranteed successful knowledge on plants from other gardeners in the community.

7.1.2 Concept 2 – Experience zone

Concept 2 addresses Dilemma 2, where the dilemma of being time efficient in the garden against experiencing the natural processes in the garden is subject. The idea for this dilemma is to create a small area within the garden, designated as a sensory experience zone (Figure 32). Here, gardeners can engage their senses and connect with nature, all the while working efficiently on gardening tasks.

This experience zone is aware of the natural processes inside the garden and will request the gardeners attention when for example certain animals are active within the zone or when specific flowers are starting to bloom. The system will send a signal to the gardener, prompting them to take a break and enjoy the natural occurrence. This concept in its essence, works as an interactive clock, where gardeners receive the possibility to work
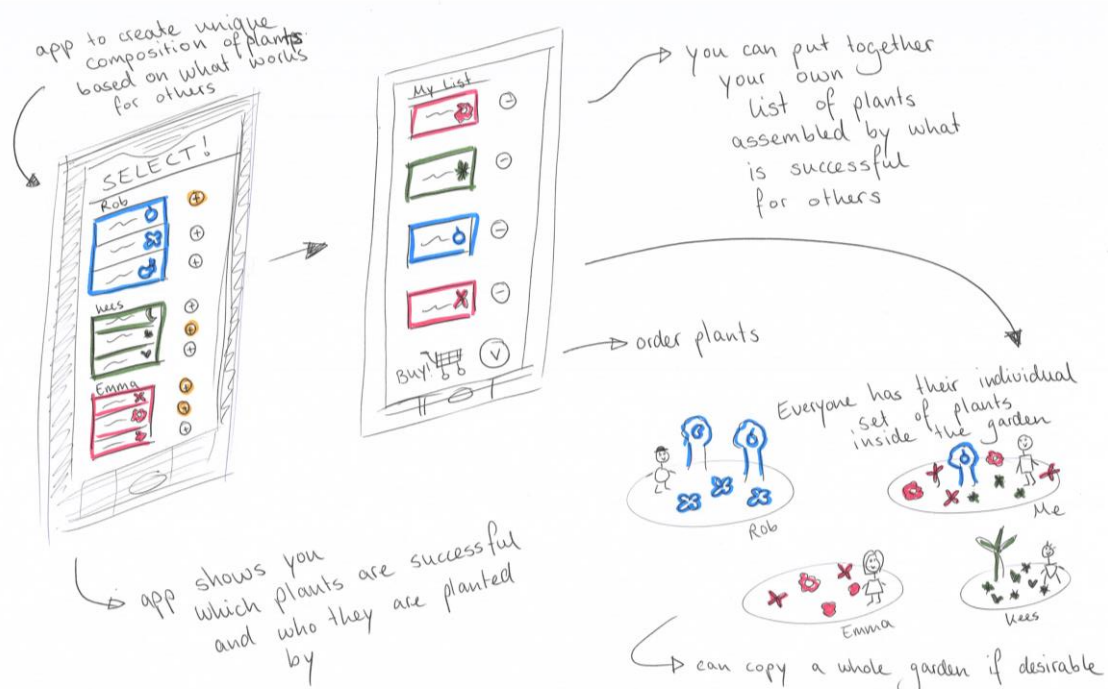
Figure 31 - Mix and match concept explanation.
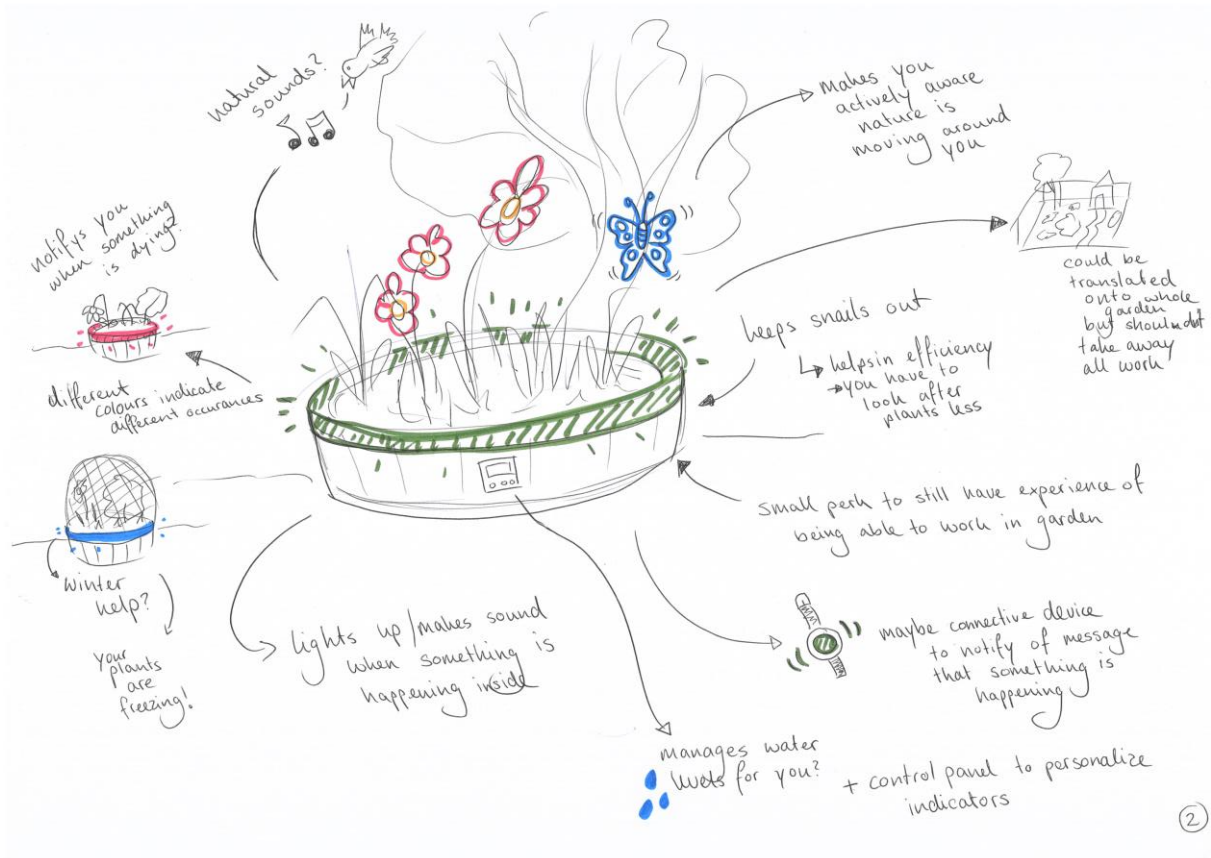
Figure 32 - Experience zone concept explanation.

inside the garden to their own preferences, while also creating opportunities for short and immersive nature experiences.

Additionally, the concept enhances efficiency through its inherent function of detecting critters, as it can detect threats to the plants in this way. Inspired by snail-repelling products, this concept is shaped similarly, preventing damage to the garden by keeping snails out. Since the gardener receives a signal when natural processes occur, it will also alert the gardener that a bird for example might be eating freshly planted seeds. These functionalities help the gardener in gardening efficiently, as well as provides the opportunity to enjoy nature.

Potentially, the concept could be expanded in ways that it would help with more tasks in the garden, such as notifying when a plant is dying and the idea could be translated onto the entire garden instead of only a small perk. Yet, it should be considered that the tasks of gardening is a desired activity within the

garden and the design should therefore not completely take over all gardening tasks.

7.1.3 Concept 3 – Remote communication

Dilemma 4 is addressed by Concept 3, where the dilemma of people desiring to receive help with their physical gardening tasks, but do not want to ask for help, afraid they might get judged for being helpless is apparent. During the interviews, it was discovered that participants inside the community garden are using a commonly used texting app called Whatsapp to ask for help with tasks which are not urgent and can be solved at a later date in a chat group with other community gardeners. However, as gardeners claimed they would prefer to not use their phone recurrently while gardening, but instead experience moments inside nature with minimal technological interference, help which would be required at a short noticed moment could rarely be provided via the Whatsapp group.
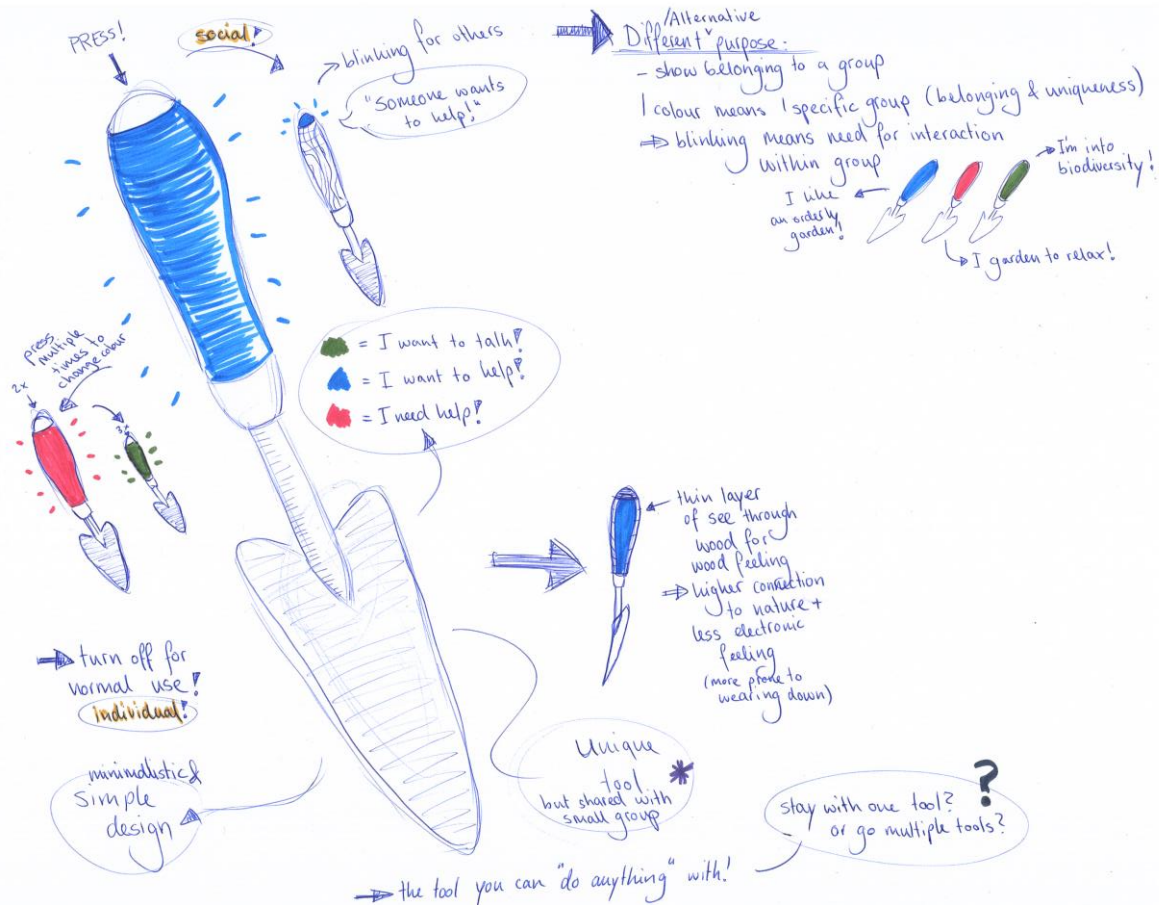
Figure 33 - Remote communication concept explanation.

To bridge this communication gap, Concept 3 (Figure 33) provides a solution, where indirect and efficient communication among gardeners becomes available.

By a simple interaction with a device, a signal gets sent to other gardeners with the same device, indicating that a person is in need of help. This could be realized through a light signal in gardening tools, for example a shovel, as it enables gardeners to notice fellow gardeners of their desire to receive help immediately. The simple and non-intrusive light indicator could be activated through simply pressing a button, which then sends a signal to other gardeners, owning a paired tool, who could respond to this request for help.

As face-to-face interactions have the potential to cause stress, and since this has been mentioned by gardeners to be the case during the interviews, a device which takes away the hurdle of face-to-face contact, might alleviate this stress. During interviews, gardeners expressed the concern that they do not want to "beg" for help. They did however share that asking in a larger group, such as an app group is less of a hinder, since multiple people at once are approached and the stress on a single person which you are requesting help from, is reduced.

The indirect communication method allows gardeners to discreetly show their need for assistance, without interfering with the gardening experience. Not only would this approach address the dilemma, it could also foster the sense of social integration into the gardening community and convey the importance of mutual support.

7.2 Evaluation of concepts

To evaluate which design is most promising considering the enhancement of well-being and suitability within the product space of the

collaborating company, the three concepts that were generated were reflected on with the criteria for Positive Design, as well as discussed with the client. Through input from the client, the ideas could be assessed in its suitability as well as prosperity for a future implementation in the company's product assortment.

Therefore, the created ideas were scrutinized with the Positive Design framework. We assessed which generated design concept we evaluated to best adhere to the criteria outlined in Positive Design, with the overarching goal of promoting individual well-being.

Through the three outlined criteria, the concepts were individually assessed through reflection on how well these concepts follow these guidelines for achieving a design that resonates with achieving human well-being.

7.2.1 Evaluation Concept 1 – Mix and match

For each of the three criteria, Concept 1 – Mix and match was evaluated as follows:

1. Design for Virtue

Assessing the concept with help of the framework, it is evident that in total, the idea of mixing and matching different plant compositions may not be considered particularly morally good. This concept essentially involves adopting what others have already achieved and using it for your own purposes. This approach could trigger feelings of shame and cause negative sentiments among other gardeners due to a perceived loss of their uniqueness.

2. Design for Personal Significance

The concept would allow individuals to progress towards their goal of being successful and unique. However, on long-term basis, there may be a lingering sense that the garden you have created is not entirely one's own but rather a puzzle of elements borrowed from others. While the garden may be unique

as a whole, it's individual components may not evoke this feeling.

3. Design for Pleasure

This concept could offer the potential for gardeners to experience momentary pleasure, as it allows them to achieve both of their conflicting goals at the moment of using the design: having what others have while remaining unique with your own composition. The design might evoke positive feelings as it enables individuals to be successful in their gardening endeavours.

7.2.2 Evaluation Concept 2 – Experience zone

Concept 2 – Experience zone was evaluated as follows:

1. Design for Virtue

As a contraption that might support the achievement of the individuals personal goals of having to take less care of their plants, the design would most likely harm animals that would profit from reaching plants that are placed within the design. It supports plant growth which could be considered positive contribution factor for the environment, however this design is increasingly focussed on profiting the individual rather than contributing to a virtuous case within society.

2. Design for Personal Significance

Concept 2 could act as a long-term support as there could be an increased survivability amongst the plants planted within the design and therefore less work which would needed to be done towards those plants. Yet, since balance needs to be considered between being able to experience nature as well as being active in the garden, the design might disrupt the balancing act, as it could consequently conflict with other goals of aiming to be active within the garden.

3. Design for Pleasure

Momentary happiness might be achieved through the design, as individuals would be

able to act efficiently within their garden, as well as experience nature through focus that is aimed to be shifted deliberately through the device on natural events that are worth paying attention to.

7.2.3 Evaluation Concept 3 – Remote communication

The idea of Concept 3 – Remote communication was reflected to achieve each criteria as follows:

1. Design for Virtue

The concept could enable individuals to receive, as well as provide assistance, promoting a balance between personal goals and virtuous actions. It might give gardeners the opportunity to increase their social scope, as well as allow reflection on their loss of virtuous activity when they are not engaging in reciprocal assistance within the community.

2. Design for Personal Significance

The concept could allow personal goals to be achieved through the help of others, without the need for face-to-face interactions. The design might offer the freedom of choice, whether it concerns asking for or offering assistance. Its aim is to eliminate potential shame when looking for aid from fellow gardeners and therefore likely facilitates the achievement of personal goals.

3. Design for Pleasure

The need for assistance is aimed to be fulfilled within this concept. It could allow gardeners to engage at their own convenience concerning the act of requesting or answering to assistance requests, without any obligatory commitments. However, a downside to the concept may be the diminishing of a pleasurable experience through unanswered help requests.

7.3 Concept choice

Through this assessment, including increased positive feedback received from the client towards Concept 3 – Remote communication, this idea was chosen to be continued with as the final concept. Reflected on through the Positive Design framework, we see that this idea has the highest potential to increase well-being through its comparable positive feedback towards each of the three criteria presented through the Positive Design framework.

Although this concept may cause a negative pleasurable experience through unanswered assistance requests, it should be considered that this concept does not only take into consideration 1 group of gardeners, but also the segment of gardeners which would like to help others and get offered a possibility to do so.

Therefore, it is concluded to be the concept with the most potential to contribute to human flourishing.

8. DEFINING CONCEPT

8. DEFINING CONCEPT

Through iteration in form of sketches, explorative prototyping and scenario based design (Rosson & Carroll, 2009), the final concept was iterated on and further defined.

Concluding from the assessment with the Positive Design framework, Concept 3 was chosen to be continued with as the final concept. Not only does this concept idea provide the opportunity for two different groups to interact with each other and fulfil their goals, it also assumably provides the biggest potential to support human flourishing and therefore subjective well-being amongst gardeners.

What contextually needs to be considered for the ideation of this concept is that is aimed to solve a dilemma specifically placed within a community garden amongst community gardeners. In particular the community garden Delftse Hout, which is the community

garden which provided the insights for data collection, will this concept be considered to be designed for.

In the following, the concept is further developed and defined, to ensure that it covers the necessary aspects of working as a developed concept.

8.1 Sketching - Shaping the final concept

Through sketches, the concept was iterated on and defined in its use and form. A base for the final concept was developed and further defined through Explorative Prototyping and scenario based design.

Continued on Concept 3 – Remote communication, the idea of the concept remains to create an indirect interaction between at least two gardeners. However, instead of the device itself being inside a tool
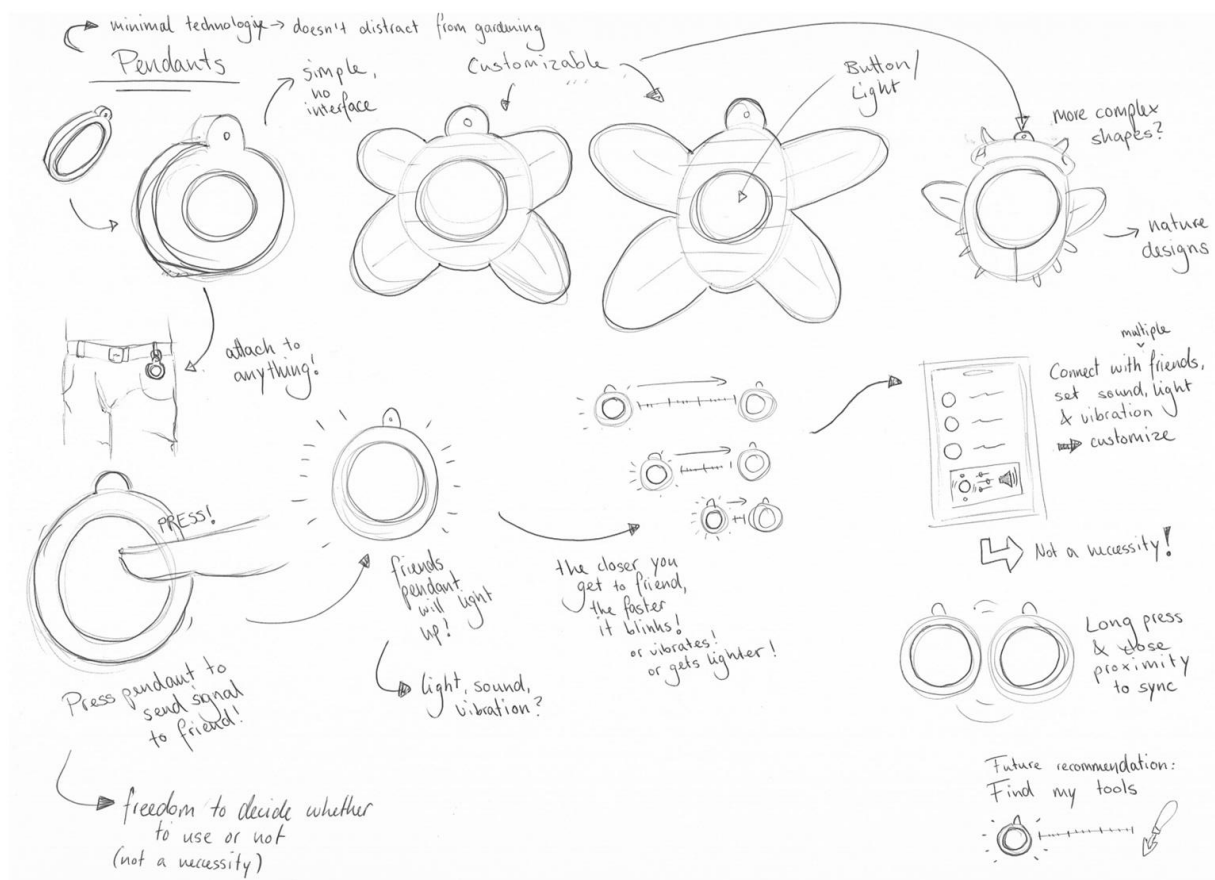
Figure 34 - Iteration through sketching on Concept 3 - Remote communication

which is already existent within the gardening context, a new separate tool was developed. These choices were made according to iteration which can be found in Figure 34 and Appendix L.

These iterations also provided shaping of the final design in terms of adjustments and further defining, in order to fit the concept into its respective context. These design decisions which should be incorporated in the final concept are explained below.

8.2 Design decisions

Resulting from the sketches and research on the gardening context, different components for the design were defined as a starting base to the final concept. Why these aspects are important for the development of the concept are explained in the following.

8.2.1 Portability

A development based on the iterations made on the initial concept is to make the device a stand-alone wearable and attaching it to the gardener. Making the device compact is perceived to be desired within the gardening space concerning convenience and practicality.

As the device will be intended to be used at any given time, it was perceived to be useful if it could be carried around with the gardener. This can prevent the device from getting misplaced and the gardener would not have constantly monitor its whereabouts, as commonly happens to other gardening tools within the garden. This has become evident from the various blog posts and guides from gardeners which have experienced losing their tools easily within the garden (Damrosch, n.d.; "How do you all keep from losing small garden tools?," n.d.; Michel, 2010, 2021).

8.2.2 Notifications - Light, sound, vibration

To ensure functionality and intended use, the choice was made to incorporate different elements of notification for the gardeners.

When a gardener is in need of help, other gardeners are required to be made aware of this need, otherwise the need will go unnoticed.

Therefore, gardeners who are in need of help can easily access their device to send a signal to other gardeners who will receive a notification. These notifications should be easily noticeable, even when the user is not directly observing the device, as gardeners have been observed to be busy and active within the gardening space, focusing on the task they are aiming to perform.

To guarantee that notifications will be noticed, different senses will be touched upon with the device. Through multiple sensory modalities, in form of light, sound and vibration, gardeners will receive the notification that a fellow gardener is in need of assistance.

8.2.3 Requesting & Responding

As the concept incorporates a two-way interaction, the device should facilitate both requesting for assistance and responding to assistance requests. During the interviews the participants have expressed their worries towards whether their plants will be fruitful, therefore we do not want to add another doubtful experience where the gardeners are left in the unknown where they do not know whether they will receive help or not. Hence it is important that gardeners are able to receive responses to their requests.

It is important to note that this interaction should remain simple to not divert the focus of gardeners from the act of gardening itself. The clarity of which interactions are meant for requesting help and which are for responding should be given within the concept.

8.2.4 Wide range – Involving multiple gardeners

From the interviews, it could be derived that multiple gardeners showed their willingness to help others with tasks, but expressed their incapability of doing so as they are unaware of

those potential requests for assistance that are not getting shared amongst gardeners. Gardeners have experienced struggles themselves ("*My sons help because some things are just not doable alone*"), but therefore also shared their desire to have more possibilities to help others ("*Nice if there were more reasons to help each other*"), as from their own experiences they are aware that gardeners might desire help.

Since this has been expressed by multiple gardeners during the interviews, the idea to incorporate a wide range of gardeners that are able to request and respond to assistance requests arose.

The idea is that the product can be synchronized with multiple gardeners that have agreed to assist each other in the community garden. When one gardeners sends out a signal requesting assistance, multiple gardeners will have the opportunity to respond. This will not only increase the likelihood of receiving help if there are multiple gardeners willing to assist, but also broaden the social network amongst gardeners. The involvement of multiple individuals responding to a request offers opportunity for social interactions and it can promote exchange between gardeners, therefore potentially strengthening bonds within the gardening community.

8.2.5 Proximity
Considering that the concept will be used within a community garden, as this is the context where the dilemma has been derived to be experienced, the space should be taken into account. The garden complex Delftse Hout covers about 122.500 square metres, which means that the space is quite large and therefore navigating within this space might be difficult. Therefore, it would be beneficial for the gardeners within the community garden to be able to locate where the signal for assistance is coming from in order for them to be able to assist.

Hence, to determine who is sending the signal, a proximity meter will be integrated in the device. This will allow individuals to locate each other more easily. The device will indicate what direction to follow to reach the person requesting help for instance through the light of the device blinking faster when gardeners are heading in the correct direction. Not only does this provide a clear indication of direction, but it also aligns with the gardeners' characteristics of being explorative and their desire for discovery.

8.2.6 Locking mechanism
Since gardening is an activity that requires a certain amount of movement in order to accomplish tasks, there are already a range of products on the market that incorporate locking in order to prevent unintended use. Especially when products are potentially close to the body, locking helps prevent unintentionally triggering products, and therefore keeping the user safe.

As gardeners are already facing the uncomfortable experience of not wanting to feel shame through showing they are incapable of being autonomous, adding onto this shame through accidental use of the product would be counterproductive.

Therefore, inspired from existing gardening tools, a mechanism will be included within the product that allows locking.

8.2.7 Material
The material should be appropriate to the gardening context. However, not only the physical context is important but it should also facilitate the characteristics of gardeners, who have been observed to take interest in recycling materials for their garden.

Hence, making it weather resistant as well as durable, as it will be exposed to weather and dirt, provides the necessary precautions to these conditions of the garden environment, but it should also lean onto the gardeners morale of acting sustainably and therefore consider using recycled materials.

8.2.8 Charging

To ensure that the functionalities of the device, such as blinking and locating other gardeners through proximity, are achieved, the product will need to be charged. When defining the concept further, a method of charging should as a result be considered.

8.2.9 Company style

Finally, what should be considered as well when creating the product, is that it suits the company style of the collaborating company Talen Tools. This company specializes in gardening tools and the product should reflect the company's style and fit within their product range.

8.3 Explorative prototyping

To explore how we can build upon giving the product shape and defining its interaction, explorative prototyping with shapes was performed (Figure 35). By engaging in explorative prototyping, we aimed to align the design of the product more closely with its intended purpose and user needs, creating input for ideas together with other individuals. The physical properties of the explorative session aimed at providing the participants with an increased tangible mindset and feel for using tools within the gardening environment.

For this process, with foam, different, randomized shapes were formed and insights were gathered from the shapes and forms to provide ideas for potential methods of interaction among gardeners. It was also used to see which shape and interaction with the product would fit in terms of usability, contextual fit and alignment with the company's image.

8.3.1 Interview set-up

A small scale test was conducted with randomly inquired individuals, that expressed an interest in gardening and who were asked to tell us how they would interact with each of the shapes in a gardening context in terms of requesting help. Informed Consent was orally

obtained from the participants and no other data than input on the shapes was documented.

During short interviews, focus was put on the intuitiveness as well as recognition of forms in a context that would make the product intuitive to use, as aiming for simplicity within the gardening context was desired to not shift the focus from gardening onto other time consuming appliances.

Figure 35 - Explorative prototyping session with foam shapes.

The shapes that were created during explorative prototyping were made out of two different sorts of foam and varied between organic, as well as geometric shapes to test possible interactions with a product that is intended to serve as a mediator for asking for help. The product should be easy to carry around and ensure the undisturbed experience of gardening and the shapes were therefore designed as small handheld shapes. The insights from these interviews provided valuable guidance for designing a concept that would align with the participants' preferences and expectations.

8.3.2 Interview results

During short interviews, five participants gave feedback on each shape, as well as expressed which shapes they would prefer for the

intended interaction. The findings from these interviews can be summarized as follows:

Recognition within familiarity
With the shapes, participants expressed associations with products and objects they were already familiar with. This familiarity led them to interact with the shapes similarly as they would with these products or how they associate these objects to be interacted with, based on the context they are normally in.

For example, a shape which resembled a butterfly or bee was thrown into the air, as this is the common context of these to be in.

Complexity confusing
Even though some shapes were noted to be more ergonomically shaped and were preferred to be held, they led to confusion among the participants. They expressed uncertainty about the interaction with these shapes and in some cases, stated that they would be reluctant to use these within the described gardening context.

Desired interactions
Certain shapes led participants to express a desire of how they would like to interact with these. The interactions included pressing, squeezing, breaking, inserting into the ground, stepping on, looking through and throwing into the air.

These interactions were dependent on the length and form of the shape, as well as on the material. Soft material induced the reaction of pressing it, while rigid material was associated with sticking it in the ground or breaking it.

Preference for soft, round button-like shapes
The majority of participants expressed that they prefer a soft, round button-like shape to interact with within the garden. These shapes were perceived simple, easy to understand and quick to interact with, which is important when gardeners are busy tending to their gardens.

8.4 Scenarios
Another step in the concept refinement involved the implementation of scenario based design (Rosson & Carroll, 2009).

This method would allow to refine the concept further into its details, providing a more context connected approach, where the environment and each step within the interaction could be considered. By envisioning possible futures with the concept, mistakes that were made during the initial design development could be eliminated and additional opportunities which the design could offer were simultaneously discovered. This process also aided in pinpointing problems which might occur with the implementation of the concept.

During this process, two personas were created which guide us through three different focal aspects for scenarios where the concept would play a role: typical, infrequent, as well as exceptional use cases. These scenarios incorporate the shaping of signals and the interaction of signals between individuals used within the concept.

In this section the typical use case is explained. The scenarios for infrequent use cases and rare use cases can be found in Appendix M.

8.4.1 Personas – Kees and Tessa
For the scenarios, two short personas, characterized by age and role within the community garden were introduced to serve as primary users of the concept within these scenarios.
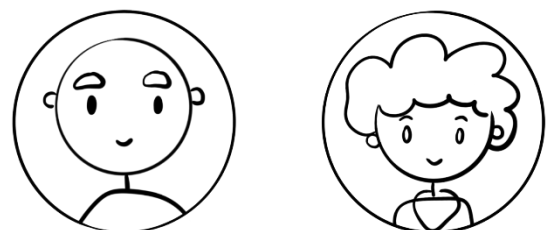

Figure 36 - Personas Kees and Tessa

To guide the scenario's, two simple persona's – Kees and Tessa (Figure 36) – are defined as

people who experience each scenario. Kees and Tessa can be imagined as retired workers, both aged around 60 who do gardening as a hobby inside a community garden. Both are relatively new to the community garden and have not created a social environment yet. It is defined that when they joined the community garden, they were offered the possibility to receive a small device from the community garden board – the PocketHelp – which they could utilize for calling for help to other gardeners active at that moment inside the garden.

8.4.2 Scenario – Typical use case

Kees starts his day by riding his bicycle to the community garden where he is part of. Today, he has planned to remove the big, deceased root that has been taking up space in his garden since forever. He has been aiming to make a little vegetable garden there instead.

A. Activating the product

Arriving at the garden, Kees puts away his jacket and bag where he has stored his lunch inside in his cabin. He then continues to go into his gardening shed to retrieve the tools he needs to work the root out of the ground. He picks up his tools and sees his PocketHelp, which has been attached to its charging station on the wall, next to where his tools are hanging. When he sees the device, he considers that it might be possible that he needs some help today, so he takes the device off the wall and clicks it onto one of the loops for the belt of his pants using the clip attached to the device, activating his device as "active".

B. Requesting assistance

Kees starts digging around the root, aiming to loosen the roots inside the ground so he can pull it out. However, when Kees finally has loosened all roots, he notices that the root is too heavy to move. Since he had made an appointment with a friend later that day and he had set the goal for himself of removing the root today, he didn't want to wait for another day where he would have asked family for help. He remembers attaching the PocketHelp to his pants and reaches for it, turns the button onto "HELP" and presses the button. His device lights up.

C. Responding to assistance request

At the other side of the garden, Tessa, who is enjoying a short break from her gardening activities, notices that her PocketHelp, which she also carries around with her, is vibrating and giving off a notification sound. She takes the device, sees that it has started blinking and considers whether she shall go and help a fellow gardener in need that she hasn't met yet. Since she is eager to get to know other people inside the garden, as well as offer her help to others, she sees this as an opportunity, cuts her break short, turns the arrow on the device to "yes" and clicks it. The device starts blinking faster. She gets up and starts walking out of her garden, into the direction where the blinking of the device becomes even faster. Other people who have received the help signal as well, receive the message for a few minutes still before it automatically turns off. If everyone had declined Kees' request for help, his device would have automatically turned off after all responses of active devices were registered.

D. Receiving assistance

Kees' PocketHelp has started blinking, showing that someone has answered his help request and is on their way. He continues freeing the root more and his PocketHelp blinks faster, the closer Tessa gets to his garden, until he sees Tessa arrive at his garden. Due to the proximity of Tessa's PocketHelp reaching the short range of Kees' PocketHelp, their devices make a short notification sound and deactivate after.

They greet each other and Kees explains what the problem is, while they both turn their PocketHelp's back to a locked position. Tessa starts helping Kees and they lift out the root together. Kees feels slightly guilty about cutting Tessa's break short and offers her to drink a quick cup of coffee with her, as she has saved him a lot of time with the root. They

exchange numbers to stay in contact about further gardening activities and say their goodbyes.
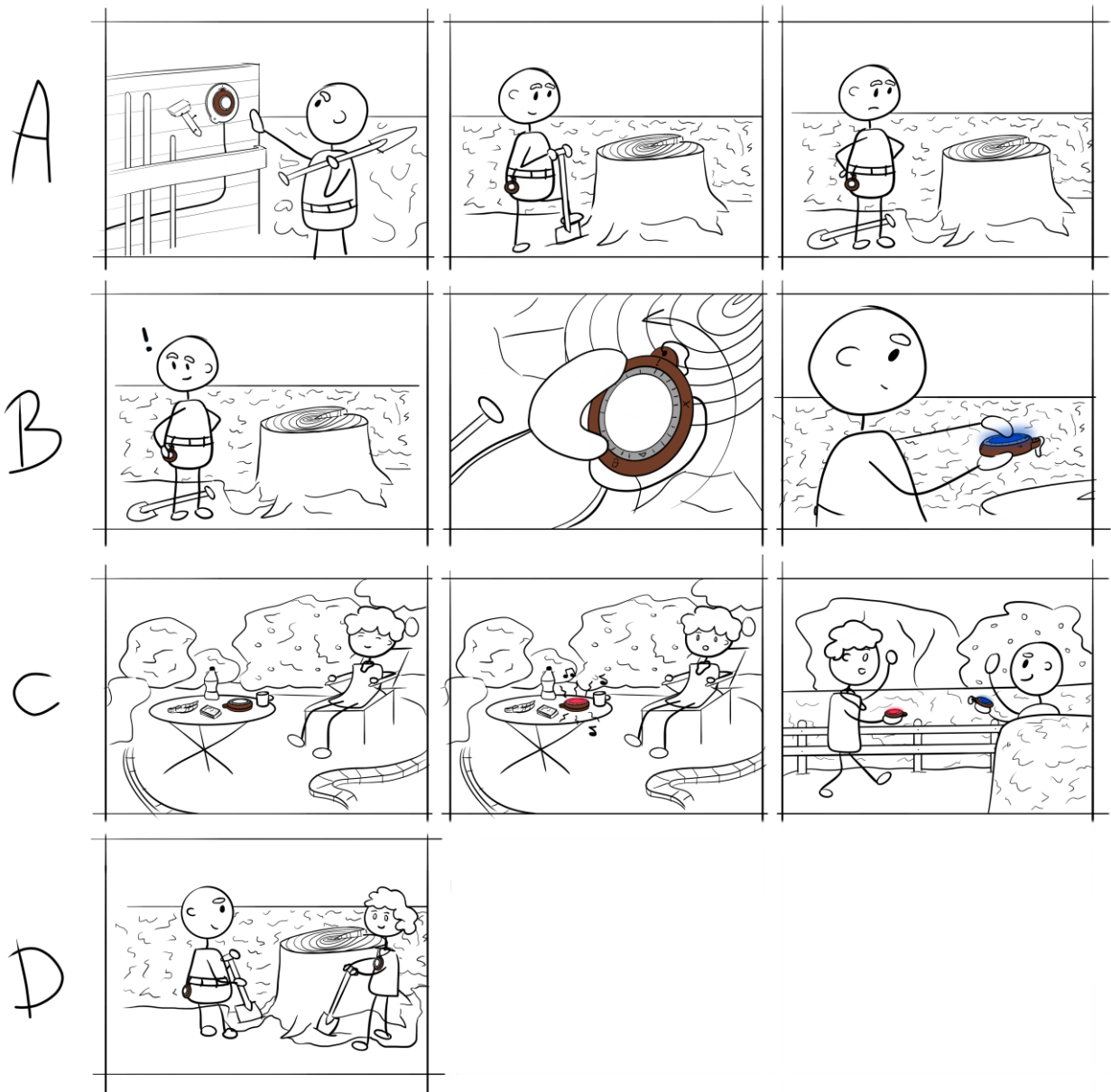
Figure 37 – Typical use case scenario. Kees requests help with his PocketHelp and Tessa responds to his request, coming to help him.

8.5 Conclusion

Through the definition of the concept, in combination with the explorative prototyping as well as the creation of scenarios, the concept could be defined further in its details, providing a base for the final concept definition.

9. FINAL CONCEPT & PROTOTYPE

9. FINAL CONCEPT & PROTOTYPE

Based on the results from iteration on the final concept idea, the final concept could be defined. The concept and its components are explained in detail as well as the motivation behind the components of the concept. As part of the final concept, a prototype, created for representative and testing purposes will be presented in this section as well.

Figure 38 - Drawing final concept - The PocketHelp

9.1 Final Concept - The PocketHelp

The PocketHelp (Figure 38) is a small hand-held device which is attachable to the body. Its main functionality is that it enables gardeners within a community garden to request assistance as well as provide assistance to other gardeners in need. Through simply pressing a button, a signal gets sent across the community garden, reaching anyone who also owns a PocketHelp and is available at that moment. The name of the concept originates from its round shape and size similar to this of a pocket watch.

In the following the different components of the PocketHelp will be explained in more detail, building upon the predefined concept components explained in 8.2 Design decisions.

9.1.1 Shape, Colour & Material

The choice of colours and materials for the device and loading station is related to the gardening context, as well as the collaborating company. The choices aim to align the design elements with the company's image and the gardening environment, resulting in a coherent product.

The base of the PocketHelp is round and made out of wood. The shape of the PocketHelp was determined through the Explorative Prototyping session, where participants were asked for feedback on their preferred way of interacting when wanting to receive help in a gardening context (see Explorative Prototyping). A round, silicone button in the middle enables for an easy pressing interaction with the device. A small metal ring is placed around the button and can be turned. This function is related to the symbols and locking, which will be explained later.

The choice of colours and materials is deliberately made through the connection between the gardening context and the collaborating company's image. Both the device and loading station are made out of wood, aligning with the company's product range and reinforcing the connection with the natural gardening environment. This material choice promotes a sustainable approach, as the surplus of wooden tool scraps can be used to manufacture these components.

The ring on top of the device is made from metal, which not only complements the company's product style, but also adds durability to the design, considering the tool will be subject to environmental elements.

The device is mounted on a wooden, leaf-shaped loading station and kept in place via magnets (Figure 39). This enables easy mounting and demounting onto the station. The loading station is leaf-shaped to create a nature-oriented appearance, emphasizing the connection with nature and therefore upholding the gardening context within the design. It will be offered in blue, as well as red, corresponding to the company's logo with the rationale for this dual-colour choice further elaborated in the Packaging section.

Figure 39 - PocketHelp mounted to its leaf shaped loading station.

To ensure the device's functionality, it incorporates electrical components inside the loading station, as well as inside the PocketHelp. These are elaborated further on in Technical components.

9.1.2 Station

The station, as previously described in Shape & Material, has several functions. Next to serving as a loading station for the PocketHelp, it also indicates the availability of gardeners who are either willing to offer assistance or seeking help. While the device is placed within its station, it remains inactive and cannot send or receive help requests. Only when activated through dismounting, the gardeners will be able to answer or request. The station can be mounted on the wall, together with other gardening tools (Figure 40).

From the designed scenarios, it was concluded that the station should also offer a fail-safe reset option. When users are concerned about the functionality of their PocketHelp, they can use the reset button located on the loading station to reset their device. This way information and reassurance is provided to users when they suspect their device might be malfunctioning.
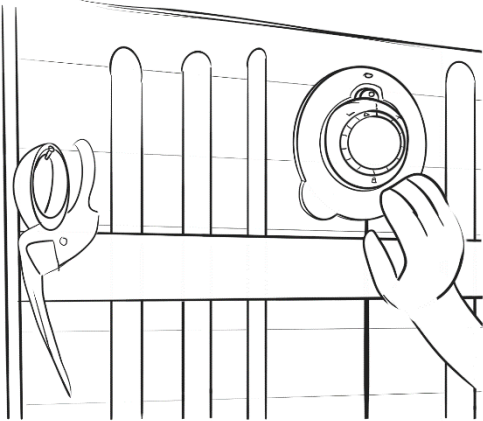
Figure 40 – Sketch of PocketHelp within its station, mounted alongside other gardening tools.

9.1.3 Portability

As earlier defined, the PocketHelp will be a carriable device. The shape and size of the PocketHelp, as well as a latch attached to it, ensure that the device is carriable, making the PocketHelp roughly seven centimetre in diameters. Portability is a key aspect within the design, as it offers users the flexibility to decide when to use it. Whether they are engaged in low-maintenance or high-

Figure 41 - Sketch of an example of how the PocketHelp could be carried on the body.

maintenance tasks, since users can carry the device on them, they are left with the freedom of choice whether they want to utilize it at that moment. The portability also ensures that the PocketHelp is less likely to be misplaced and notifications are more likely to be noticed promptly, due to the close proximity to the users body, making it visible, audible and tangible (Figure 41).

9.1.4 Notifications
The PocketHelp uses a multi-modal notification system to ensure that assistance requests are clear and quickly conveyed. This includes, sound, vibration and light. Unlike app-based solutions, like the earlier mentioned Whatsapp groups, where response to notifications can sometimes be delayed and requests for help will be sent to all
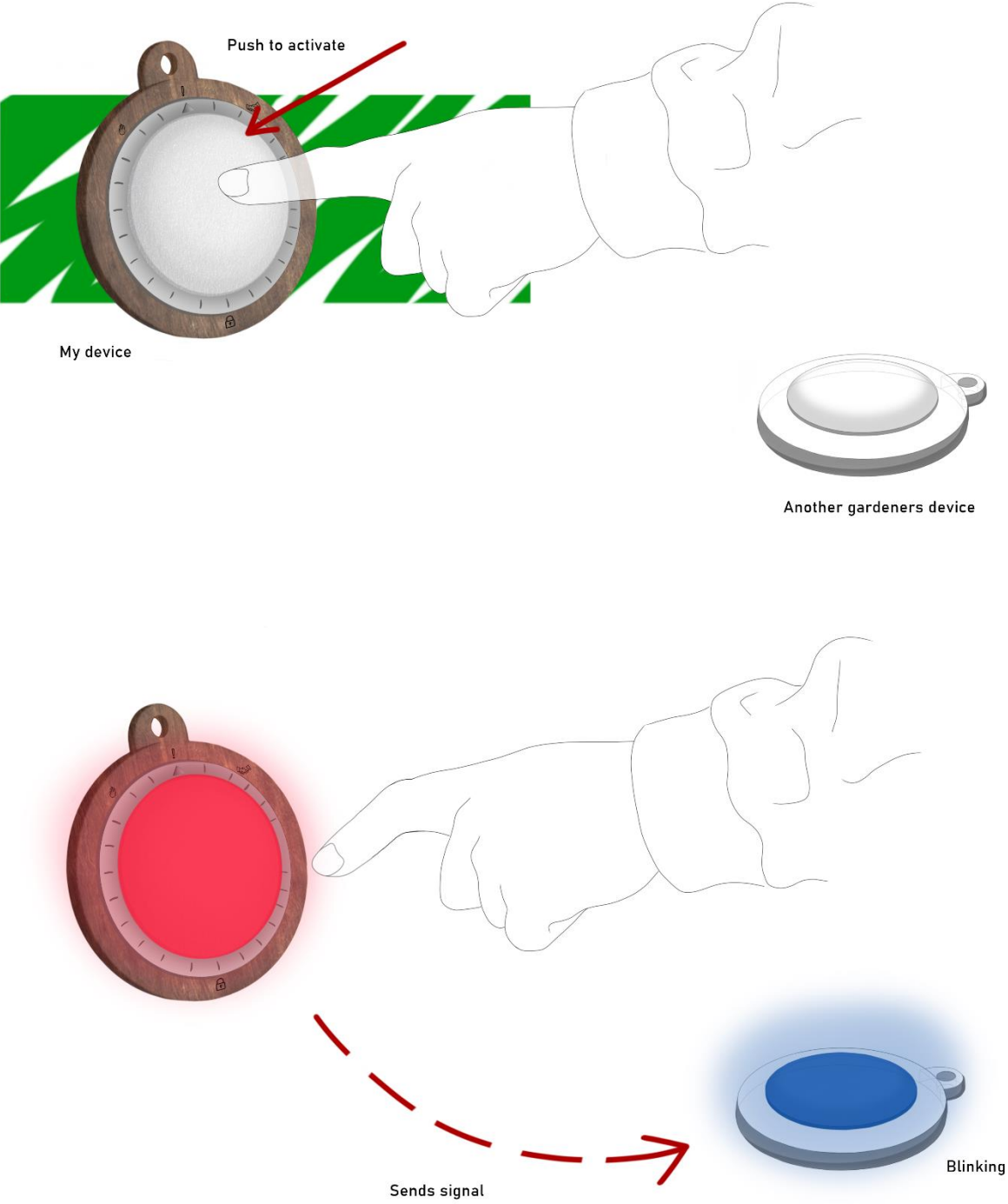
Figure 42 - Sketch of how the PocketHelp may be interacted with and how other active PocketHelp respond to this request.

members within that group, including those to whom the requests may not be relevant as they are not present inside the garden at that moment, the PocketHelp sends immediate notifications to gardeners inside the garden who have activated their devices. This notification approach through sound, vibration and light, increases the likelihood of gardeners noticing requests and also engages the users' senses, raising awareness to the heightened use of senses within the garden environment. An example of interaction can be seen in Figure 42.

9.1.5 Button
Communication within the gardening environment is a new aspect to be designed for within the gardening space and therefore no solutions for indirect communication within this context have been explored yet. As derived from the short interview session as explained in 8.3 Explorative Prototyping, it was determined that seeking resemblance in objects is a common occurrence. Based on these observations, a button was chosen for the main interaction with the PocketHelp. Buttons have been recognized as a function for social interaction and communication in other contexts, such as ringing a doorbell or answering the phone.

Next to this, using a button is also a clear, quick and easy interaction. From the interviews it was found that gardeners prefer tools which are intuitive and easy to understand and use. They want to use them to get their tasks done quickly.

9.1.6 Turning
The PocketHelp features a turning mechanism. Initially, the idea for this mechanism emerged from locking the device to prevent accidental help requests. Given that the garden environment contains various tools that when unlocked or activated accidentally can result in undesired consequences, the PocketHelp should also offer a way to prevent accidental assistance requests. In this context, common locking

methods, like switches might not be suitable, as they could easily become jammed through dirt and debris in the garden.

The shape of the PocketHelp, which is round, allows for a turning mechanism to be implemented. Turning would not only prevent dirt from entering the system, but also allow for multiple settings on the device, which are necessary for requesting and responding to assistance requests. The metal ring around the button can be turned to select different modes: locked, requesting help, confirming a help request or denying one. The design of this turning mechanism allows a practical solution tailored to the garden's environmental challenges (Figure 43).

Figure 43 - Sketch of PocketHelp used within the gardening context.

9.1.7 Symbols
Locking, requesting help, affirming a request for help and denying a request for help are all indicated by symbols on the device.

Using symbols in the PocketHelp's interface design was inspired by other gardening tools which are used within the gardening context and have close relations to other tools in different contexts. Through the creation of a mood board to provide inspiration towards iteration on the method of interaction of the PocketHelp (Figure 44), resemblances were found between tools within the gardening context and tools from other contexts. For example, a spoon could be seen as a small

Figure 44 – Mood board for inspiration towards interactions.

shovel, while a watering can is a shower head with a water reservoir. These examples led to brainstorming about how communication methods outside of the gardening context could be adapted within this context. This resulted in the idea of using symbols, inspired by phone call symbols for either confirming or declining a call.

The symbols which are used within the concept are based on what is presumed to be most recognizable within the given context. Iteration on the symbols (Appendix N) was done before deciding on the final subset of symbols which can be found in Figure 45.
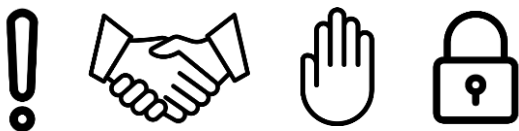
Figure 45 - Symbols used for the PocketHelp.

The selected symbols, mainly represented by hand gestures, aim to symbolize a "hand-in-hand" sense of companionship and the willingness to help others within the garden,

or showing personal limitations in offering assistance.

9.1.8 Proximity

From the base components established earlier, the concept builds on the concept of proximity through using increasingly faster blinking light as an indicator of finding other gardeners within the garden (Figure 46).
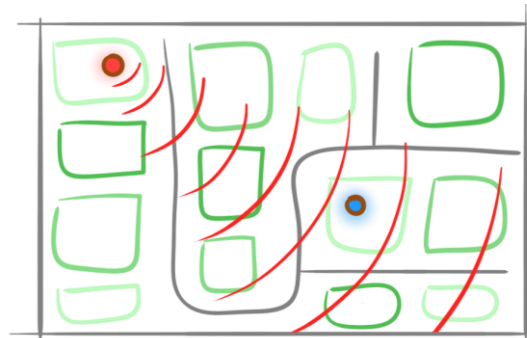
Figure 46 - Schematic representation of proximity finding within the community garden.

9.1.9 Packaging

To communicate its function and give a guide to users, a packaging will be provided to costumers with a short instruction of how the device is meant to be used.

It gives a clear indication what the concept is about, how the concept will be used within the context and that there are at least 2 PocketHelp necessary for functionality, as they are meant to interact with each other.

Therefore the packaging is designed to show that there is a connection between 2 devices, alternating 2 different styles of packaging. Both PocketHelp sprout from the same tree, symbolizing the shared community in which the design would be used (Figure 47).

The colours of both packaging and design are alternating in red and blue, which are part of the company's logo colour scheme.

The packaging should indicate that more than 2 devices can be connected to each other.

9.1.10 Technical components

As part of the design, potential technical components which could be used to achieve the desired interaction are defined. Important components for the design would include a rechargeable power supply, proximity measuring, information exchange between different devices, light, speaker, a vibration motor, a button and a microcontroller for necessary programming of the interaction.

Power supply

A small, rechargeable lithium-polymer or lithium-ion battery should suffice for the concepts power requirements.

Proximity & information exchange

As the product includes the tracking of other gardeners within the garden, technical components capable of detecting distance between devices is required. According to own measurements taken of the gardening complex Delftse Hout, which is one concrete example of where the concept will be used, it has about a size of 350x350m. If we look at the diagonal axis through the garden, which would be the longest range distance needed for two devices to detect each other, the proximity & information exchange range of the concept should be about 500m. To achieve this, there are several options:

1. Bluetooth

A potential low-cost solution for detecting proximity is through the use of Bluetooth. Here Bluetooth Low Energy (BLE) could be interesting, as it has the opportunity to either

Figure 47 – Alternating packaging PocketHelp including backside with explanation.

broadcast a signal as well as receive a signal. However, often the signal exchange between two individual devices equipped with BLE might require a rather low distance, hence why often static BLE beacons are used to transmit information (Montanari, Nawaz, Mascolo, & Sailer, 2017). This could however be implemented within the context of a community garden, seeing it is a fixed space where tracking will take place.

2. Ultra-wideband

An alternative could be UWB proximity detection. UWB has recently been implemented in increasingly more consumer-level devices, such as the Apple iPhone 11. This method allows for an accurate multi-tracking of devices. Up until now, however, research has shown that the range of UWB is still limited (Ma et al., 2022). There is however a potential to explore more into the possibility of using UWB, as more development is taking place, where accuracy is improving and consumer-level application is increasing.

Light
Simple low voltage RGB LED lights would suffice as light within the device.

Speaker & vibration motor & button
Similarly to phones, an electrodynamic speaker and small vibration motor could be used within the device. A simple, but durable, maintained push button, preferably made out of soft, comfortable material such as silicone, would also suffice within this concept.

9.2 Prototype
A prototype was developed as a representative prototype of the design. It serves to showcase the function and feeling of the concept and was also developed for testing purposes (Figure 48).

The prototype was programmed and tinkered by hand. In the following some of the components of the prototype are explained in further detail. Additional images of the production process and the prototype can be found in Appendix O.

Figure 48 - PocketHelp Prototype in context

9.2.1 Button

The button which was developed for this concept was hand-tailored and poured from silicone in a 3D printed mould (Figure 49). This mould was modelled in the CAD program SolidWorks 2023, 3D printed with a 3D printer and sanded down to ensure a smoother surface of the button.

Figure 49 - 3D printed mould for prototype button.

The choice to make the button out of silicone was based on the interview results of the 8.2 Explorative Prototyping, to create an increased haptic experience for the testers and providing a testable prototype that in its material and shape is as close to the intended concept as possible.

9.2.2 Casing and station

Both the casing of the PocketHelp, as well as the loading station are made out of wood. For both, scrap wood was used in order to make them, coming close to the actual idea of the concept to make the wooden parts out of recycled material. A combination of milling, sawing and sanding was used to bring the components into shape.

9.2.3 Turning

On top of the PocketHelp itself, a small turnable ring is placed. Even though it is intended to fabricate this component out of metal for the actual product, for easier processing purposes, the ring was 3D printed from three different parts and glued together. To resemble the intended material of metal, the glued 3D ring was painted with grey spray paint (Figure 50).

9.2.4 Symbols

The symbols presented on each PocketHelp prototype are small paper cutouts. Due to the

Figure 50 - 3D printed, hand painted turnable ring on top of the PocketHelp.

small nature of the symbols, as well as the material properties of wood, the conscious choice was made to cut out the symbols out of paper, as the natural wood would smear drawn on symbols.

9.2.5 Electronics

For the functionality of the product, technical components in form of a Seeeduino Lotus, as well as Grove parts were used for programming the PocketHelp prototype.

For this, two Grove chainable LEDs and two Grove buttons were connected to a Seeeduino Lotus board. Through soldering, cables were elongated for the sake of providing increased distance between two PocketHelp.

The coding of the interaction between the two PocketHelp prototypes was done in C++.

9.2.5 Interaction

For the prototype, one interaction was coded between prototypes PocketHelp 1 and PocketHelp 2 (Figure 51).

Figure 51 - Interaction between PocketHelp 1 and PocketHelp 2.

The intention is that PocketHelp 1 will be interacted with first through pressing on the button. Then, PocketHelp 1 will light up permanently, while PocketHelp 2 will start blinking. This interaction will represent the request for help being sent out to another active PocketHelp.

The next intended interaction is that PocketHelp 2 will be pressed as a response, which will cause both PocketHelp 1 and PocketHelp 2 to start blinking with an increased speed. This will symbolize the response of an active PocketHelp to the request for assistance and the narrowing proximity between the two devices.

10. EVALUATION, DISCUSSION & CONCLUSION

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10.1 Evaluation

To evaluate the intended function of the concept, as well as whether the research question could be answered, the concept was evaluated through testing with community gardeners. In the following, the set-up, as well as the results of the evaluation are explained.

10.1.1 Evaluation set-up

For the evaluation set-up, participants were recruited, materials provided and activities and questions were prepared in order to evaluate whether the concept fulfils the task of solving Dilemma 4 "I want to receive help from fellow gardeners, but I also want to keep a positive self-image".

Participants

For the evaluation of the concept, community gardeners which had participated in the project previously and provided insights on the dilemma of wanting to receive help but not seem helpless were recruited.

As the focus of the dilemma lies within the gardener who wants to be assisted, additionally to these participants, an independent actor was asked to act out the role of a gardener that is answering to an assistance request. Through this actor, who was unfamiliar to the participant, emotions on receiving a response to a yet unknown gardener were captured.

Materials

For the evaluation session, the developed PocketHelp prototype as described in 9.2 Prototype was used, as well as the PrEmo, which was used during the initial interviews with the participants.

Through the repetitive use of the PrEmo, we aimed to see how emotions would change within the gardening context when a dilemma they might have been facing gets addressed.

Activities

For the evaluation, the participants were asked to explore the prototype, which was handed to them in its packaging.

The participant was provided with a set-up where they imagine they have been suggested by their community garden board to buy the PocketHelp as it would help them connect more with fellow gardeners. They received the PocketHelp within its packaging to explore the concept. Then a scenario was implemented where they encounter a task within the garden which they are not able to perform alone. The definition of this task was first explored by the participants themselves, through reflecting on any scenario they have encountered before in which they required help, which was unavailable at that moment. When they did not have such a scenario, a suggestion to such a scenario was made.

As a result to a successful interaction with the PocketHelp, the actor, impersonating a fellow community gardener, was asked to appear.

Involvement in the testing was kept to a minimum, to provide the participant with space for understanding and interpretation of the prototype. Through this, it was tested whether the concept is self-explanatory and understandable.

Questions

To support the testing activity and create understanding towards the experience of interacting with the concept, as well as the impact on well-being through aiming to resolve the dilemma, questions were asked throughout the evaluation process.

The questions were created to guide the different stages of the evaluation process, starting with the introduction of the PocketHelp, followed by the first interactions with the concept, the two possible responses on help requests and general reflection on the design.

Introducing the PocketHelp:

1. Can you describe your understanding of what the PocketHelp is supposed to do based on the information provided?
2. What are your initial emotions, thoughts and impressions as you encounter the PocketHelp for the first time?
3. How do you feel about the shape, form and properties of the PocketHelp?
4. Can you describe a scenario where you would have desired assistance but no assistance was available to you?

Interacting with the PocketHelp:

1. How did the first interaction with the PocketHelp make you feel?
2. How do you feel about requesting assistance through the PocketHelp?

Receiving a positive reaction (the actor comes into play as a fellow gardener providing assistance):

1. How did you feel when the actor, representing a fellow gardener responded positively to your assistance request?
2. What emotions did you experience when the PocketHelp provided feedback through blinking that help would be on the way?
3. Describe any emotions associated with the successful interaction through the PocketHelp with the help of the PrEmo tool.

Receiving a negative reaction (no one will come to provide assistance):

1. How did you feel about the lack of assistance?
2. What emotions did you experience when the PocketHelp provided you with the information that none would be coming to assist you?
3. Describe emotions associated with the feedback of absence of assistance and the absence of assistance in general through the PocketHelp with help of the PrEmo tool.

Post-testing reflection:

1. How would you describe the overall experience testing the PocketHelp?
2. Are there any questions or concerns you have about the concept?
3. Were there any aspects of the interaction that you found particularly intuitive or challenging?
4. Did you feel in control over your interactions and requests?
5. How do you feel about the idea of using the PocketHelp in a scenario where you need assistance?
6. Do you think the PocketHelp could positively impact the emotions associated with seeking assistance within the community garden?
7. What aspects of the PocketHelp would you suggest to be improved?

These pool of questions provided a base for the review of the PocketHelp through the prototype in terms of user experience, usability and potential impact it provides. Through paying attention on answers concerning feeling morally engaged, pleasurable and personally significant, the questions would help provide insights on the achievement of the goal of designing for well-being.

During the interview, the questions were adjusted based on the dynamics of the evaluation session and the received responses.

10.1.2 Evaluation results
During the evaluation, interviews were conducted with four different types of gardeners who had participated in the project previously, each with unique experiences related to seeking help within the gardening complex.

In the testing phase, participants initially shared their perspectives on the understandability of the PocketHelp design. Feedback on the devices form and shape varied among interviews, as did the emotions experienced when receiving help or

encountering a negative response to a help request through the PocketHelp.

The interviews aimed to assess whether the PocketHelp's intentions were clear and successfully proved and addressed the researched dilemma. Any concerns or connotations of the design that had not been discovered previously were also documented. Lastly, participants briefly discussed potential improvements to the design. All answers to the interviews can be found in Appendix P.

This section provides an overview of the types of gardeners interviewed and their relationships with helping, their past experiences with helping, the emotions they experienced during testing the concept, and their concerns about the design. Detailed feedback on the interaction, the device's shape and form, the recognition of design intentions, frequently observed connotations of the design, and suggestions for improvement by the participants can be found in Appendix Q.

Type of gardeners and their relationship to helping

Building on previous research, it is evident that there are diverse gardeners within the gardening complex Delftse Hout. Through the interviews, it was revealed that these gardeners exhibit varying attitudes towards exchanging help within the community, resulting in four distinct types of gardeners (G1, G2, G3 and G4) that were interviewed.

While one participant (G1) consistently expressed a willingness to be a helper rather than someone requesting help, another participant (G2) conveyed to enjoy establishing new social connections with other gardeners. G2 does not mind personally approaching others for help and have a strong inclination to assist fellow gardeners ("*I even ask if people need help when they are standing at my gate*").

The third participant (G3) expressed a preference for solitude. While open to helping

others, they do not actively seek a lot of assistance. They feel that if they were to request help through the PocketHelp, they would also feel obligated to offer help, which is not necessarily always desirable for this gardener.

The last gardener interviewed (G4) seemed to be sociable and well-informed about various gardeners in the complex. While willing to offer assistance to others, G4 does not actively seek help themselves. They are concerned that requests for assistance might be unnecessary, preferring not to inconvenience other gardeners with their own requests, therefore often attempting to solve problems by themselves.

This diverse mix of gardeners, inherent to the community garden, offered insights in how the PocketHelp would be perceived by different types of gardeners which are present in the garden and examine its suitability within the context. Throughout these types of gardeners the presence of the dilemma was also examined.

Previous experiences with seeking help

When asked about their previous experiences where they needed assistance, three out of the four participants (G1, G3 and G4) stated that they could not recall such moments. However, one participant shared that they once required physical assistances due to the inability to perform a task alone. They said, "*My boyfriend and I once tried to put a tent on top of our pergola, but we couldn't do it alone. So, we had to go around the garden to ask people for help. We felt a bit shameful, because it looked like we hadn't planned ahead of time, but we know that people here are actually quite relaxed. Ultimately, we felt proud that we had accomplished it together. Although it is easier to ask if you know each other.*" (G2).

This example sheds light on the presence of the dilemma of seeking help from fellow gardeners while maintaining a positive self-image, which is the challenge that the PocketHelp aims to address within the

community garden setting. Although the participant expressed a willingness to approach others for help, there lingered a sense of shame in having to make such requests, as they might get judged for not planning ahead.

Emotions

Throughout the evaluation of the PocketHelp, different emotions were noted to be experienced by the different participants. The PreMo tool (SOURCE) was utilized to support the determination of emotions that were felt during the device's usage (Figure 52).

Figure 52 - Participant evaluating the PocketHelp prototype with help of the PrEmo tool.

Distinct emotional phases emerged during interactions with the PocketHelp:

1. Receiving help

Participants experienced positive emotions during this phase. This included joy as gardeners are able to receive help, hopefulness about another gardener coming to assist, excitement regarding the uncertainty of the helper's identity, satisfaction when their help request received a positive response, and a sense of joy for feeling appreciated when helped.

2. Anticipation of help:

Some participants expressed negative emotions just before receiving help through the PocketHelp. They felt doubtful about the urgency of their requests, leading to feelings of shame for considering their need for help unnecessary. Additionally, two participants experienced guilt, as they believed that requesting help should involve a reciprocal exchange, meaning that they should be both a giver and a receiver. This led to potential hesitancy in using the device if they could not or did not want to reciprocate assistance.

3. No response to help request

As there is the possibility that there is no positive response to help requests, this was tested during the tests as well. Participants' feelings varied between indifference and negativity. Some participants considered it acceptable to not receive help, understanding that individuals may be occupied and unavailable to provide help, as they might be themselves as well. On the contrary, other participants anticipated a mix of negative emotions when left without assistance, sadness being the most frequently mentioned emotion, as without help, they would not be able to complete a task. Anger and disappointment were expressed by some participants, questioning the purpose of owning a PocketHelp if no help would be provided. Additionally, annoyance was felt when urgent tasks would be left uncompleted and loneliness arose due to expecting to receive assistance, but not meeting those expectations, making participants feel overlooked.

Concerns and questions

As part of the evaluation process, participants expressed various concerns regarding the usage of the PocketHelp. Towards the end of the interviews, participants engaged in

discussions around several hypothetical scenarios:

- *What if 100 people show up?*

Participants questioned the potential overwhelming response, expressing concerns about managing assistance from a large number of gardeners.

- *What about people who just want to talk?*

Participants were worried regarding gardeners who might use the PocketHelp for socializing instead of practical reasons, indicating a concern about differentiating intentions.

- *Should I give everyone coffee?*

Social obligations were part of the concerns, as participants were wondering about the etiquette of reciprocation and if they should give something in return for received help.

- *What if people ask for help for non-urgent tasks and take advantage of good nature of others?*

One participant raised the concern about the possibility of individuals exploiting the system for non-urgent matters, potentially taking advantage of the good will of fellow gardeners.

- *What if someone gets called for help and then doesn't want to help?*

Participants were concerned about the reliability and commitment of helpers.

- *What if I send a help request to someone I dislike?*

As part of the social challenges that arise through the PocketHelp, one concern expressed by participants was that they would possibly have to interact with individuals with whom they have a complicated relationship.

- *What if I am on my way to help someone I dislike?*

Adding on to the social challenges, this concern also expressed that individuals are worried about feeling uncomfortable if there might be a possibility that they would have to help someone they feel negatively about.

These questions emphasized the participants reservations about the concept, particularly concerning the volume of responses, the nature of requests and the social dynamics. The overarching theme was a desire for more control over the assistance process, including choosing who responds to requests, managing social expectations and ensuring the system is not abused for non-urgent matter or misplaced social interactions, or having the concept facilitate these options in a different way.

Conclusion

Overall the PocketHelp concept was perceived positively, establishing a meaningful connection with community gardeners by addressing a recognized dilemma within the context. The positive feedback was especially aimed towards the idea's potential to overcome challenges when it comes to fulfilling tasks that are unable to performed alone and connecting gardeners that seek a solution together with gardeners that can provide a solution. This way, the expansion of a social network can be fostered as well.

However, not every gardener perceived the PocketHelp as equally useful. While a majority experienced positive emotions when the device worked as intended, providing assistance, the concept triggered a range of negative emotions during moments where help requests were left unanswered. This variation in emotional responses highlights that the concept is due to further development, especially when considering achieving subjective well-being as outlined within the three principles of Positive Design.

Additionally, concerns emerged during the testing phase, emphasizing that gardeners might get into contact with fellow gardeners

with whom they have a strained relationship, as well as uncertainties about the expectations that are present when being a helper or a help requester, making the concept less attractive to use. These concerns, left unattended in the current design, show the need for improvement in future iterations of the PocketHelp.

In conclusion, the positive aspects of the concept is that is resonates with the community gardening context and provides a solution to a relevant dilemma.

However, the challenges of different perceptions, emotional responses, and unaddressed concerns indicate that further adjustments are necessary for the PocketHelp for it to be universally accepted as a tool amongst all community gardeners.

10.2 Discussion

Through this project we aimed to answer the research question "**How can design facilitate the bond between gardeners in a community while gardening together and therefore improve their well-being?**". The goal was to discover how, through researching the target group of gardeners with the help of discovering dilemmas, we can create a design which contributes to enhancing their subjective well-being, touching upon the Positive Design principles by Desmet & Pohlmeyer (2013) of achieving human flourishing through the three factors of designing for moral value, designing for pleasure and designing for personal significance.

For this we chose a dilemma within the community gardening context: "I want to receive help from fellow gardeners, but I also want to keep a positive self-image.".

Through the process of addressing this dilemma through the concept of the PocketHelp, we aimed to disclose how we can contribute to well-being within the gardening context through design, facilitating Positive Design as well as Dilemma-Driven Design as the methodological framework throughout the project. We are able to state limitations that were subject during the project process, as well as future recommendations based on the project outcomes.

10.2.1 Contribution

This project provided insights on dilemmas experienced within the gardening space, including the potential of design to influence the well-being aspects of gardeners within specifically the community garden space.

As previous research has primarily aimed to see how the act of gardening itself enhances well-being, we broadened the scope towards the experience of well-being within the gardening context. This project included the discovery of potential points where we as designers could be of significance towards enhancing the subjective well-being amongst gardeners.

Through guidance of the Positive Design framework, as well as through the methodology of Dilemma-Driven Design, we were able to pinpoint a dilemma, which provided us with the main input for being able to design for human flourishing.

Using Dilemma-Driven Design within this project offered an example of how we can use the identification of dilemmas to design for well-being. Through the creation of the PocketHelp as a resulting design from an identified dilemma, we demonstrated how we can solve problems, which not only focus on the creation of conventional solutions, but where we also focus on emotional, as well as social dimensions.

Furthermore, through this approach of Dilemma-Driven Design, we are able to contribute to Positive Design, as the main goal of this project was to enhance the subjective well-being of gardeners. By addressing the dilemmas faced by gardeners, we provided a solution which not only solves the practical problem of people needing help and now having the possibility to reach out to people whose willingness to help is present, but also seeks to improve the emotional and experiential aspects of gardening. We alleviated the emotional burden of lack of self-image through shame, diminishing it through bringing two groups together that are seeking each other – gardeners needing help and gardeners desiring to help. Through incorporating features that elicit positive emotions, such as receiving assistance and mutual support, the design provided us with an example of how through design we can create an environment where users experience joy, pleasure and a sense of virtue.

However, the solution created through the Dilemma-Driven Design method shows a nuanced perspective. While the design facilitates positive emotions and enhances subjective well-being during successful

interactions, it also presents drawbacks in scenarios where the help requester is left without assistance. Further details on this aspect are elaborated on in section 10.2.3 Project outcomes.

10.2.2 Project process
The project process was guided by data collection, analysis, ideation, concept generation, iteration and testing.

This process of developing the concept of the PocketHelp, proved to be an iterative process. Through interviews and explorative prototyping, our design decisions were based within data provided by gardeners. The iterative nature of our design process, where we alternated through diverging through ideas and converging back to increasingly specific dilemmas, was primarily driven by various ideation methods, involving refinement and exploration of ideas addressing the dilemmas faced by gardeners as stakeholders of this project. We were able to continuously adapt our approach based on insights gathered from previous steps and evaluated through the principles of Positive Design.

Through this process, we were able to explore the scope of how we can design to address the needs of gardeners, shaping the PocketHelp into a solution that addresses a dilemma faced by community gardeners. Testing this concept with the community gardeners allowed us to close the circle, coming back to the stakeholders and evaluating the achievement of addressing their needs.

Limitations
Within this project process however, we were subjected to different limitations.

One of these limitations is that the project was executed within a specific time-frame, hence why certain spaces, such as interviews, analysis, ideation, prototyping and testing could not be evaluated further.

Additionally, the scope of participants recruited for this project was limited. The project incorporates only a few participants and interviews from the pot gardening and home gardening segments, while the majority of the data input came from community gardeners. Through the recruitment method of contacting gardeners who would like to participate in the research voluntarily, from all of those participants, we also came mostly in contact with people that have a lot of time during the research. This leaves us with the question: What about the group of gardeners that do not have a lot of time?

The interviews conducted with those participants were also translated by the researcher, therefore information might have gotten lost in the translation process.

Finally, for prototyping we were limited in available resources and our capabilities within coding the functional interaction prototype. With a more developed knowledge in coding and through increased available resources, the prototype might have provided more interactions for testing.

10.2.3 Project outcomes
The PocketHelp stands as a result of the design process. It addresses the identified dilemma resulting from the research process of this project, as through its properties of providing indirect communication with fellow community gardeners it provides a balance between seeking assistance and maintaining a positive self-image.

Resulting from the evaluation done in 9.4 Evaluation, we could see that the chosen dilemma of seeking assistance and maintaining a positive self-image was considered relevant to the project outcomes. It contains the essence of Dilemma-Driven Design through addressing conflicting properties within the gardening context and provided a relevant input for the process of Positive Design as through this dilemma, we were able to create a design aiming to

enhance the subjective well-being of gardeners.

Through the development of the PocketHelp, addressing this dilemma, we were able to contribute to heightened well-being, fostering positive emotions and offering an increased meaningful connection within the community garden environment when interactions between gardeners requesting and providing help go seamlessly.

Yet, these aspects of subjective well-being are only achieved within the context of a successful interaction meeting specific conditions. This success is dependent on whether a gardener, who requests help, receives assistance from another gardener with whom they share a positive relationship and who is willing to offer the desired help.

Subjective well-being could be diminished if the expectations of the helper and the individual seeking assistance do not align or if a help request goes unanswered. During the evaluation, these situations were found to evoke concerns and negative emotions, including anger, sadness, loneliness and annoyance among the gardeners.

Recommendations

These project outcomes are subject to recommendations for future research. The possible actions for different stages of the project are described below.

Data collection

For data collection we recommend to expand the quantity and diversity of interviews across different gardening segments. It should be explored if dilemmas are consistent across various gardening spaces, considering we already saw a differentiation in goals depending on what the community garden was focused on: while gardeners in larger community gardens, with large gardens have no desire for increased space, gardeners within smaller allotment gardens do express their need for increased availability of space.

We also recommend to refine questions asked during interviews, aiming to dive deeper into the emotional space. Different dilemmas might emerge through a different approach of exploration.

Throughout the process, it is advised to maintain closer contact with the target group, increasing the potential to develop solutions that are increasingly focussed on being user-centric.

Methodology

Throughout this project, the starting point was centred around discovering dilemmas within the gardening space. This is one proposed methodology to discover how we can pinpoint areas that offer potential to design for well-being. It is suggested to go beyond this method and broaden the scope of how we can contribute to the enhancement of well-being within the gardening space. Investigating other methods that might facilitate the contribution to improve well-being of gardeners is recommended.

Analysis

For future research, it is advised to consider narrowing down the multitude of statement cards derived during the analysis process to provide a clearer overview. Possibly exploring alternative approaches of thematic analysis, for example deductive analysis, might yield different results.

Ideation

It might be considered to focus ideation on one dilemma instead of four. This might facilitate a deeper understanding of the problem space and increase in-depth problem tackling.

For this process, one also might want to experiment with other ideation methods to generate a wider range of different ideas and solutions.

During explorative prototyping only foam models were used within a quick, context free evaluation session. Foam models have the properties of being sound-less. While these

quick tests did provide us with insights on the desired shapes, using prototypes with sounds might have influenced the outcomes and induced different interactions, such as shaking, etc. In the future such short test might have to be adjusted and opened up further to explore what influence those factors have on the outcomes, including expanding those tests into the appropriate context to receive more focused results.

The concept
Through testing we could see that, although the concept was experienced positively when a positive interaction was established, when no response was provided through the PocketHelp, the majority of emotions was noted to be negative. Therefore, the concept is recommended to be adjusted towards these negative interactions in order to enhance subjective well-being in cases when no response is provided, as well as adjusted so concerns that were mentioned during interviews get resolved.

A possible solution for this could be an indicator that shows how many devices are active at the moment of requesting assistance. This way, negative emotions about expecting responses can be prevented and people are aware about the possible amount of gardeners responding to a request. Whether this might have negative effects in return would have to be tested further.

Another recommendation for the development of the concept, resulting from the evaluation and the concerns towards getting into contact with individuals with whom a strained relationship is present, adding an app for increased personalization could be considered. From interviews it became apparent that gardeners are happy when they can design their own space, have their freedom for individualization and uniqueness, as well as the desire to prevent uncomfortable situations. Therefore, adding an app which resonates those properties would not only facilitate to the gardeners, but

also adds potential for the company, as it increases the marketing potential. The app could be offered as an extra service besides the PocketHelp itself.

While the developed concept focusses on solving a dilemma, Dilemma-Driven Design stresses that there might also be potential within triggering or moderating a dilemma. This potential is recommended to be explored within future research, including the evaluation of how these approaches might contribute to enhanced well-being.

Furthermore it is recommended to explore how the concept might be embedded more into the gardening context. With the current results, albeit being defined through properties provided within the gardening space, the concept might be implementable within different contexts and does not feel completely integral to the gardening context. Through re-evaluation of different aspects of the concept, such as the method of interaction, a stronger connection to the context might be established.

The idea of the concept itself could be further developed and translated onto different domains, for example finding tools back inside the garden. It also offers potential to be adjusted to provide more information relevant for gardeners, for example the inclusion of a compass and with that a sun watch, which helps with planting plants or checking time when active within the garden. Finding tools and the influence of time were also focal points of gardeners that were discovered throughout the research process.

As of now, the concept addresses the most inspirational and potential offering dilemma experienced within the context of community gardening. This leaves opportunity in addressing dilemmas within the other gardening styles. Additional research on dilemmas within these segments could explore further how we can be improve the experience within these segments through social gardening and how design could

facilitate the increase in well-being amongst those gardening domains.

Prototype
The developed prototype did not include all functionalities of the design and was limited to providing feedback on the setting of requesting assistance, but not providing assistance. Therefore a more elaborate prototype might want to be developed, which encompasses all functionalities of the design, such as sound and vibration and functionality of the turning wheel, showcasing how it acts within different situations.

Testing
Through an increased developed prototype, it is recommended to expand the testing focus beyond one side of the interaction. The testing scope might want to be expanded towards gardeners who are eager to provide assistance through the PocketHelp, exploring their emotional scope and perceived well-being as well.

For this, an increased participant pool to enhance the credibility of the design outcomes might want to be considered.

10.2.4 Personal reflection
Additionally to the contribution of the project and reflection on the project process and outcomes with its limitations and recommendations, a personal reflection on the different stages of the project was conducted. These personal reflections are outlined in the following.

At the start of the project, the definition of the design brief already showcased that the project required an open mindset. It encouraged loosening up the research, and therefore the design space. It prompted an increased exploration of what could be designed for, where design could be applied and how design could be utilized within the space of achieving increased subjective well-being. Initially, too many limitations were set, such as the specific gardener segment to be approached. However, breaking free from

those constraints allowed us to broaden the scope of where design could be impactful, especially through the considerations of designing with dilemmas. Being able to discover within which segment dilemmas are present and meaningful to be explored, helped in making the project more meaningful for design in general.

This project was the first time where interviews were held completely alone. The process revealed a personal challenge in adhering to proposed timeframes, as the desire was present to not appear impolite by curtailing participants. However, through this happening during the research process, we incidentally made the discovery of the eagerness of gardeners to share and their sociability. This enriched the project and affirmed the desire for social interaction within the gardening space.

The analysis process presented both highs and lows, caused by its long and thorough process due to the voluminous data. The thematizing approach, though logical, could have benefited from more time spent on the dataset. There was a tendency to become fixated on one section of interview results initially, somewhat neglecting the other gardener segments which were interviewed. This highlighted the need to distribute equal attention to each segment, especially to avoid dismissing segments and therefore missing potential relevant insights.

During the concept evaluation, initially, the concepts were attempted to be rated through the Positive Design framework. However, as the framework serves as a guideline, rather than a fixed structure, adjustments towards a more individual evaluative approach were made within this process.

Choosing to address the concept as a solution to a dilemma was a deliberate decision, although there might have been potential within triggering or moderating a dilemma. This choice might have been influenced through considering the company Talen Tools,

as tool manufacturers often focus on the development of tools to solve a concrete problem. Because of these considerations, personal biases throughout the design process might have possibly influenced this choice over other approaches to addressing the dilemma.

A personal observation towards the created design is that it can be perceived as resembling an emergency button, commonly used within care homes to request immediate attention when emergencies occur. This association was confirmed through other designers during concept presentations. Considering the age group of the target group, this perception might pose a challenge, as it could be considered repelling for them to use the concept if they also perceive this connotation.

10.3 Conclusion

During this project we took a closer look at the field of gardening and discovered how design within this context has the potential to enhance well-being. We were able to use Dilemma-Driven Design as a methodology to look closer at Positive Design and discovered dilemmas that resonate with community gardeners. Through analysis we were able to derive dilemmas that are being experienced within the context of gardening and different ideation methods fuelled the creation of ideas and concepts aimed to address the dilemmas, providing expansion, as well as narrowing down the scope of dilemmas.

This process resulted in the development of the PocketHelp, a device that offers the possibility to indirectly communicate the need for assistance to every available gardener within a community garden.

Through solving a dilemma within the gardening space, we are able to touch upon enhancing the subjective well-being of gardeners, standing in line with the principles of Positive Design.

While the design resulting from this project showcased how through design, we can facilitate the enhancement of human flourishing and therefore subjective well-being within a social setting, it also stressed the impact design can have on introducing new negative factors influencing well-being. Creating something new, especially when focused on methods known to facilitate ideas contributing to subjective well-being, may enhance well-being during intended interactions. However, it can also introduce negative emotions when interactions deviate from expectations. As designers, we must be careful and sensitive to these factors when we seek to contribute to Positive Design.

Therefore, this project has illustrated the potential of design to enhancing well-being within the gardening context through reaching human flourishing. However, as the project process was subject to limitations, further recommendations are advised to be taken to assess how else we can use design to contribute to well-being within the gardening space and how we can prevent unintended interactions to cause a reverse effect.

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11. REFERENCES

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12. APPENDIX

12. APPENDIX

12.1 APPENDIX A – Design Brief

IDE Master Graduation
Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

⚠ USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT
Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

STUDENT DATA & MASTER PROGRAMME
Save this form according the format "IDE Master Graduation Project Brief_familyname_firstname_studentnumber_dd-mm-yyyy".
Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 ! ⓘ

family name	Wijshoff
initials	F.C.	given name	Fabienne
student number	5612934
street & no.	
zipcode & city	
country	
phone	
email	

Your master programme (only select the options that apply to you):

IDE master(s): ( ) IPD   (★) DfI   ( ) SPD

2nd non-IDE master: _____

individual programme: ____ - ____ (give date of approval)

honours programme: (Honours Programme Master)

specialisation / annotation: (Medisign)
(Tech. in Sustainable Design)
(Entrepeneurship)

SUPERVISORY TEAM **
Fill in the required data for the supervisory team members. Please check the instructions on the right !

** chair	Deger Ozkaramanli	dept. / section:	Design Aesthetics
** mentor	Haian Xue	dept. / section:	Design Aesthetics
2nd mentor	Roelof Talen		
	organisation: TalenTools		
	city: Staphorst	country:	Netherlands

comments (optional)
My supervisors are from the same department, their field of expertise differs greatly.

⚠ Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v..

⚠ Second mentor only applies in case the assignment is hosted by an external organisation.

⚠ Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

APPROVAL PROJECT BRIEF
To be filled in by the chair of the supervisory team.

chair   Deger Ozkaramanli   date   01 - 06 - 2023   signature

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CHECK STUDY PROGRESS
To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair.
The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total: 30   EC

Of which, taking the conditional requirements
into account, can be part of the exam programme   30   EC

List of electives obtained before the third
semester without approval of the BoE

(★) YES   all 1st year master courses passed

( ) NO   missing 1st year master courses are:

name   Robin den Braber   date   07 - 06 - 2023   signature

Robin den Braber

Digitaal ondertekend door Robin den Braber Datum: 2023.06.07 11:11:16 +02'00'

FORMAL APPROVAL GRADUATION PROJECT
To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked **.
Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

- Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?
- Is the level of the project challenging enough for a MSc IDE graduating student?
- Is the project expected to be doable within 100 working days/20 weeks ?
- Does the composition of the supervisory team comply with the regulations and fit the assignment ?

Content: (★) APPROVED   ( ) NOT APPROVED

Procedure: (★) APPROVED   ( ) NOT APPROVED

comments

name   Joni Schuurman   date   15 - 06 - 2023   signature

J.J. Schuu rman

Digitally signed by J.J. Schuurman Date: 2023.06.15 11:38:38 +02'00'

Gardening together - Enhancing the shared experience of gardening
project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple.
Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date   17 - 05 - 2023   04 - 10 - 2023   end date

People, especially in nowadays environmental developments, such as global warming and environmental pollution, have become more and more aware of the importance of nature and have created an increased connection towards home gardening, either individually or socially. From personal experience, I have also realized that gardening together with friends or family is a common and delightful experience. People garden either to fulfil practical purposes, such as growing own food or to connect with nature or to connect with others. It has also been proven that gardening is an emotionally fulfilling task, as being in nature can create calmness and a feeling of purpose (van Lier et al., 2017).

The company that is involved in this assignment is TalenTools, a provider of gardening tools, who gives consumers the possibility to garden efficiently and be practical inside the garden. Currently, the interest of the company TalenTools, is to provide consumers with the possibility of easy-going gardening using traditional & durable garden tools. TalenTools as a company, especially through their key value of gardening with traditional gardening tools, will be able to emphasize the importance and necessity of wellbeing-focused interactions while gardening.

The focus of gardening tools has traditionally been on reliability, durability, efficiency and ergonomics. However, the meaning of gardening for people, particularly from an experience and wellbeing perspective, has only been explored very little. This is a missed opportunity since shared gardening experiences have the potential to contribute to people's wellbeing as well as the market positioning of TalenTools.

To gain new insights on the meaning of gardening in regards to wellbeing, I will use dilemma-driven design to address this challenge (Ozkaramanli, Desmet, & Özcan, 2020). For this, I will first identify dilemmas that occur during gardening activities and find out how gardening tools can be redesigned to address these dilemmas with the goal of enhancing the experience of gardening and eventually to contribute to wellbeing. The focus will be the exploration of a design solution which will either solve, moderate or even help in becoming more aware of being triggered by a researched dilemma, to offer an opportunity to enhance the involved individual's well-being through design.

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introduction (continued): space for images

image / figure 1:   Gardening together - RTV Ridderkerk

TO PLACE YOUR IMAGE IN THIS AREA:
- SAVE THIS DOCUMENT TO YOUR COMPUTER AND OPEN IT IN ADOBE READER
- CLICK AREA TO PLACE IMAGE / FIGURE

PLEASE NOTE:
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image / figure 2: _____

Personal Project Brief - IDE Master Graduation

Efficiency and practicality are often the goal in many everyday interactions. To offer an alternative perspective, the focus of this project will be to explore opportunities for enhancing experience and well-being through a shared experience of gardening between individuals.

The main research question that this project will aim to address is:

How can a design better help facilitate the bond between family/friends while home gardening together and therefore improve the long-term well-being of these individuals?

The scope of this project involves researching the context of gardening together inside a private, home owned garden and the relationship of people to each other within this context, the nature and gardening tools. For this, I will use both contextmapping, desktop research and market research. While doing so, I will identify dilemmas of gardening individuals that occur during shared gardening activities and which will act as a means to design for well-being. Co-design during the design process will support human-centered decision-making and help grasp the impact of dilemmas for the emotional well-being of individuals.

Since TalenTools has an increased focus on creating long-lasting, embodied, but also traditional gardening tools, I will explore how the final design could fit within and contribute to these characteristics.

I will start with researching the target group, who are people that garden together with their friends/family, to find out more about the motives and connections that are already established between each other and nature. I want to create a product/tool which will increase human well-being in a social setting and embeds the core values of traditionality of the company TalenTools.

I aim to deliver a final design in the embodied traditional design direction of TalenTools, which will increase the shared gardening experience positively during gardening together and therefore increase the emotional wellbeing of the individuals. Together with this, I expect to deliver deeper insight and knowledge on using dilemmas to design for well-being, as well as insights on the experience of the target group within the current context of using gardening tools. I will present the final design in the form of a representative prototype.

Personal Project Brief - IDE Master Graduation

PLANNING AND APPROACH *
Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date   17 - 5 - 2023   4 - 10 - 2023   end date

Planning Master 2023

								Midterm							Greenlight			Deadline	Grad.
Calender week	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Project week	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20
Research																				
Desk research																				
Contextmapping																				
Requirements																				
Design phase																				
Ideation: Co-design																				
Iteration																				
Concept choice																				
Prototyping																				
Evaluation																				
Report																				
Presentation																				
Meetings																				

Initials & Name   F.C.   Wijshoff   Student number 5612934

Title of Project   Gardening together - Enhancing the shared experience of gardening

MOTIVATION AND PERSONAL AMBITIONS
Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, ... Stick to no more than five ambitions.

I set up this project because I am generally interested in designing for emotions and the deeper psychology behind product usage, as well as my interest in designing physical products that get hints from technology, but do not necessarily scream technology. I want to use my knowledge on designing for emotions, together with my achieved knowledge on contextmapping to grasp what people really need and want out of products they interact with regularly. Psychological, as well as ethical aspects play a large role in the designs I want to create, which I think I have gotten quite the insight from during the DfI study. During this project as well, I want to pay close attention to the needs and limitations of individuals, as well as keeping in mind cultural and social aspects while doing research. Through working together with people for people, I can use my acquired knowledge on co-design sessions to further deepen my understanding on people and their needs and finally create a concept which is closest to humans, but also consider all stakeholders involved, such as incorporating the core values of the client. I greatly value human-product interactions and I want to create products that please the human mind, as well as body, which I think I can prove and learn more about during this project.

FINAL COMMENTS
In case your project brief needs final comments, please add any information you think is relevant.

Sources: Ozkaramanli, D., Desmet, P. M. A., & Özcan, E. (2020). From Discovery to Application: What to Expect When Designing with Dilemmas. Revista Diseña, (17), 58–83.
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Initials & Name F.C.   Wijshoff   Student number 5612934

Title of Project   Gardening together - Enhancing the shared experience of gardening

12.2 APPENDIX B – Survey

What kind of gardener are you?

Do you like getting your hands dirty in the dirt to make those plants of yours pop? Or maybe you rather stay inside and dive with your nose into the flora and fauna books? Perhaps you are not interested in gardening at all but you still help out your family and friends? Fill in this short form to let me know what kind of gardener you are!

I am ... *

○ < 18 years old

○ 18 - 39 years old

○ 40 - 59 years old

○ 60+ years old

My occupational status is: *

☐ Student

☐ Full time employed

☐ Part time employed

☐ Unemployed

☐ Voluntary work

☐ Retired

☐ Other

I am interested in gardening and/or learning about gardening. *

◯ True

◯ False

I own my own plants, in ... *

☐ my own private garden.

☐ pots around the house.

☐ a community managed garden.

☐ I don't own plants.

I take care of plants together with my family and friends and/or help them out with their plants. *

◯ True

◯ False

I actively take care of my plants or someone else's plants on a regular basis. *

◯ True

◯ False

Can you tell me a bit about the gardening you do? Do you read books about plants to learn how to take care of your own? Or do you maybe just help out someone else with their plants? If you're not "gardening" at all, could you tell me why not? Please do let me know!

Langantwort-Text

Nach Abschnitt 1   Weiter zum nächsten Abschnitt   ▼

Abschnitt 2 von 2

That's it already! Thank you for filling in the form!   ⌄ ⌃   ⋮

If you have more questions you can contact me via f.c.wijshoff@student.tudelft.nl!

12.3 APPENDIX C – Survey results

I am ...
44 Antworten

- < 18 years old
- 18 - 39 years old
- 40 - 59 years old
- 60+ years old

84,1%
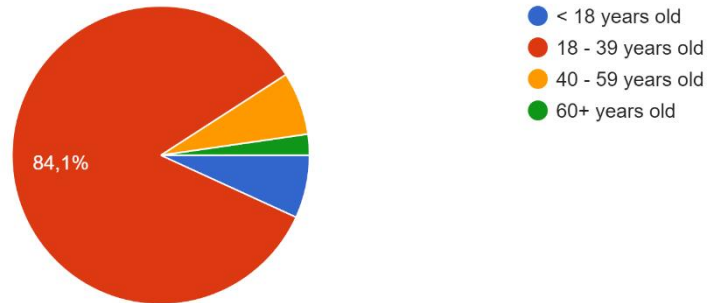
My occupational status is:
44 Antworten

Student	34 (77,3 %)
Full time employed	5 (11,4 %)
Part time employed	8 (18,2 %)
Unemployed	1 (2,3 %)
Voluntary work	3 (6,8 %)
Retired	0 (0 %)
Other	3 (6,8 %)
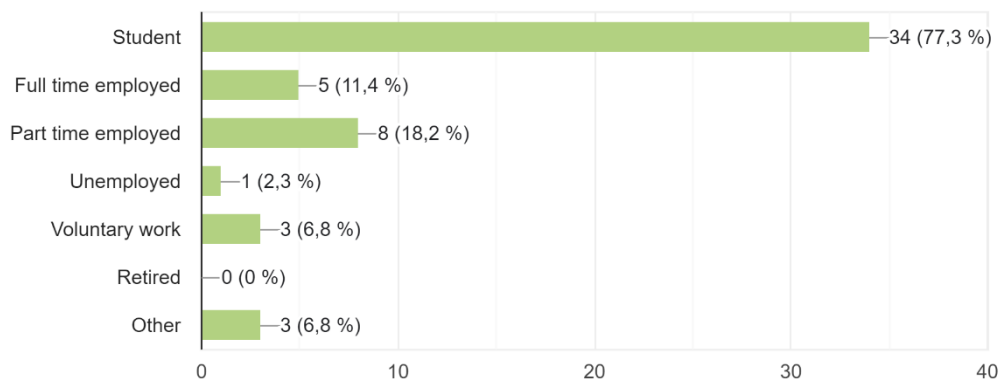
I am interested in gardening and/or learning about gardening.
44 Antworten

- True
- False

13,6%

86,4%
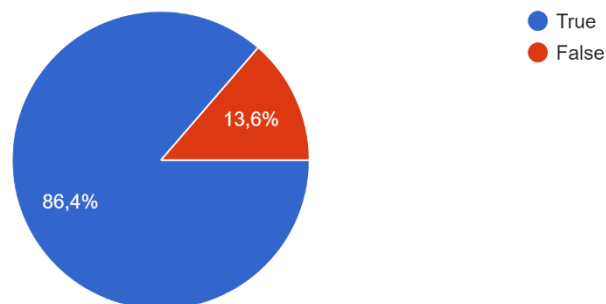
I own my own plants, in ...
44 Antworten
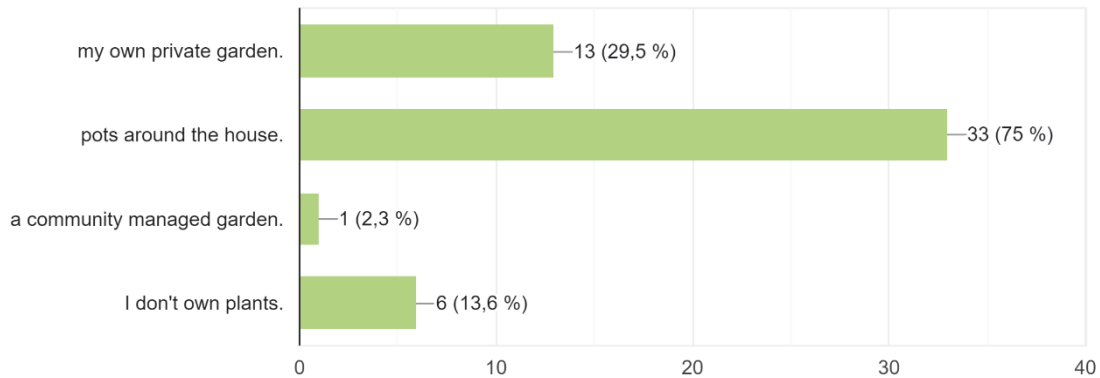
Category	Count
my own private garden.	13 (29,5 %)
pots around the house.	33 (75 %)
a community managed garden.	1 (2,3 %)
I don't own plants.	6 (13,6 %)

I take care of plants together with my family and friends and/or help them out with their plants.
44 Antworten

- True: 59,1%
- False: 40,9%
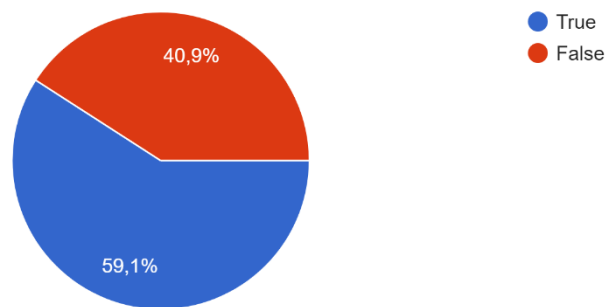
I actively take care of my plants or someone else's plants on a regular basis.
44 Antworten

- True: 68,2%
- False: 31,8%
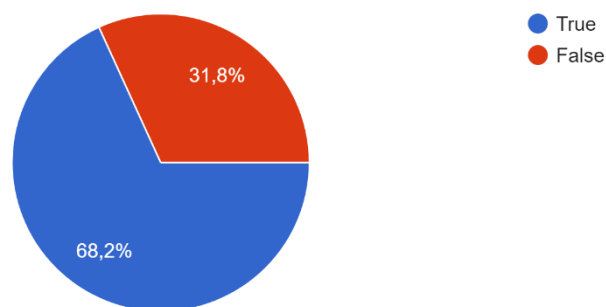
A1: I only have a houseplant which only requires watering every week. In the past I did do AH moestuintjes and grew some vegetables like cucumbers and tomatoes from it with my mom. I do google when I have questions such as when is it ripe of it there is something wrong.

A2: I don't have a garden, some pots on the balcony or window, I sometimes watch Youtube videos or search internet articles when I have a problem with my plants

A3: I search somethings about it on the internet and I use an app for giving water and teachings about diseases. Besides I help my fellow neighbors with maintaining the community garden, but I do this only when they ask for help. Tending the garden is not my first priority, because often I am already busy with work and other activities. Though I find it important that the community isnt just held up by just a few neighbours.

A4: I have an app that helps me with the watering schedule, because i would otherwise forget, but love to care for them!

A5: I have over 15 houseplants and take care of them on a regular basis. This includes watering, repotting and fertilizing them. I research the instructions for my plants when I buy them, and sometimes will get tips from friends or tiktok or reels.

A6: I just water my plants, try to keep them alive, but don't do a lot of "gardening" besides giving them water. Sometimes I put them in a bigger pot, when they seem to outgrow their current pot. And if they keep dying, I might Google the type of plant an what their needs are. I would like to spend more time on my plants, but I don't have time for it and it's not my priority. That's why sometimes my plants die; I don't have/make time to water them enough.

A7: I watch a lot of informational gardening content on YouTube. I usually just take care of the plants that I have, by regularly watering them and checking the soil, and see if they have enough light. I also help a couple of other people to take care of their plants.

A8: Just watering and hopefully keeping them alive.

A9: I was always interested in gardening, but I didn't have much space in my previous home. However, when we shifted to a slightly bigger place during the COVID-19 pandemic, I became completely immersed in gardening. YouTube became my gardening teacher, and I started helping my mom with all the garden work. Surprisingly, I started growing more plants than she does! Currently, as I am back to being a student away from my family, I have only a few plants due to limited space. However, I have realized that the size of the space doesn't matter. Whether you have one plant or a huge garden, the happiness they bring remains the same. It's all about how we make time for these tiny beings who give us so much in return for the small acts we do for them. Now, I also help my friends take care of their plants when they are away on vacation. It's rewarding to extend my green thumb expertise beyond my own garden!

A10: I have one or two books about houseplants but I never ended up reading them. I just water my plants and mix in some nutrients. I'd like to learn more about gardening but it's not that high on my priority list and I've been busy lately.

A11: I water plants, let cuttings grow, share them with friends/family/neighbourhood, occasionally water my mom's/boyfriend's plants

A12: I am taking care of plants that friends have given me, so it is more a emotional responsability, since I appreciate their gift. I have not bought plants for myself because I do not have much time to take care of them. I follow tips from friends that have experience and when I have an issue I proceed to ask them.

A13: I'm usually the one getting the help from my parents and friends. I also have the 'Planta' app that helps me keep track of my plants and care schedule, and I tend to read up quick facts on a plant when I get it into my posession.

A14: I just water the plants. I leave the garden plants managed by my children.

A15: I talk about indoor plants with people and learn through social media

A16: My plants are in pots inside my house

A17: I watch Youtube videos and read blogs to look for tips for the indoor plants and also to take care of possible pests

A18: My plants need to grow on their own without much help.

A19: At home I mow the lawn, keep big plants in shape with hedge trimmers and try to keep the biggest weeds out of the flower beds. But it all depends on how much time and motivation I have. If I see some Interesting plants I often research them with help of Google Lens or PlantNet, to see if the plant is native or invasive.

A20: I have five or six houseplants in my room that I take care of (usually watering them once a week is enough). When there is an issue with them, then I ask my plant expert friends or look up the plant on google. When my housemates go on holidays I take care of their plants too.

A21: I search internet for information

A22: If have quite a lot of houseplants in my student room which I take care of. I kind of water them what I feel is needed, considering the warmth and how dry the soil is. Sometimes when a plant doesn't look too good, I try to find the species of the plant and tips for it online. Also, when I sometimes buy a new plant, I look up the species and the needs of the plant so I know approximately how much to water it and where to put it in my room. I also often water the houseplant of my roommates which are placed in our living room. Also, I try to grow more herbs from the ones I buy in the supermarket

A23: I dont garden personally, but have always been interested in learning about the subject and potentially starting to care for plants myself.

A24: I learned how to take care for different kind of plants via Wikihow

A25: I grow my own vegetables and herbs in a private garden and around the house. I don't read books, just do it from experience!

A26: I grow all kinds of succulents and help dad with his plants. I learnt how to take care of them from the internet (reddit in particular) and through practice over the year I had them.

A27: I currently have house plants in pots in my student house but back in india we had a very beautiful garden. We would mostly not have to buy vegetables but could eat food from our garden. We'd create our own compost and cleaning agents with bio-enzymes. My mom was the main driver. But here, I take good care of my plant babies and google if I feel they need some extra 'doctoring'

A28: I do help with catering our family plants, but I am not actively learning how to garden properly. I mostly do the preping for the plantations.

A29: I help out my mother sometimes when she needs it. For myself I have loads of plants in the house that I also try to multiply. I also have a balcony where I try to grow plants to eventually eat

from, last year it was a disaster but this year it might work out! I do often get bugs and lice that ruin it for me outside and have difficulties managing that…

A30: i eat plants]

A31: I have a few plants in my room at my parents home. My big love is my bonsai (a ficus Benjamina). I've also gotten a book, from my grandpa, which talks about different kinds of bonsai trees and how to take care of them. My favourite part about my plants is how they look and bring life into my room. It's amazing to see how much progress you can make with the right techniques and let something grow because off your care. (I also love the pottery!) But we also have a lot of different plants and trees in the garden, either for the aesthetic or because of the fruits and vegetables.

A32: I don't read books. I do like to try to plant seeds of stuff I eat, like avocados and mangos. For that, I find articles or videos how to do it. Other than that I just water my plants and sometimes those of roommates.

A33: I read in the internet or in the one plant book I have how much water my plants needs and how much sun. Also, I write it down in my to do list

A34: i dont "garden" in the traditional sense, im an hydroponics engineer, and do indoor succulents, old fish tanks/aquariums are used for both, i dont "actively take care" of my plants, cause i dont have to, they are fully automatic :D

A35: I just water the family potted plants.

A36: Just trying to make my plants survive because they look nice

Interview Tuinieren

Introductie:

Hallo en bedankt dat je/jullie de tijd neemt/nemen om deel te nemen aan mijn onderzoeksproject!

Mijn naam is Fabienne en ik ben erg geïnteresseerd in jouw tuinierervaring en kennis. Dit interview biedt een geweldige gelegenheid om meer te weten te komen over jouw/jullie passie voor het tuinieren en om waardevolle inzichten te delen.

Tijdens het interview gaat het om verschillende aspecten van het tuinieren, met zowel de persoonlijke, als ook de gedeelde ervaringen tijdens het tuinierprocess.

Ik wil benadrukken dat jouw/jullie deelname aan het interview geheel op vrijwillige basis is en elk moment afgebroken kan worden. Ook als er vragen zijn die je/jullie niet wilt/willen beantwoorden, is dat prima. Het interview is op anonieme basis, dus zowel namen, als ook foto's zullen gecensureerd worden. Om dit te bevestigen heb ik een geinformeerd toestemmingsformulier meegenomen waarvan ik je/jullie wil vragen dit te ondertekenen als je overeenkomt met de voorwaarden.

Laten we beginnen en samen ontdekken wat er als actieve tuinier te beleven valt!

Algemene vragen:

Mijn naam is:

_____

Ik ben zo oud:

_____

Van beroep doe ik dit:

_____

Mijn hobby's zijn:

_____

_____

Ik tuinier met:

_____

Vragen over het tuinieren:

Hoe vaak tuinier je? En hoe lang duurt zo een sessie?

Wat vind je **leuk** aan tuinieren?

Wat vind je **niet leuk** aan tuinieren?

Wat motiveert je om te gaan tuinieren? Wat zijn je doelen?

Zou je meer willen tuinieren? Zo ja, waarom lukt het niet?

Vragen over de ervaring:

Hoe bereid je je voor op het tuinieren?

Wanneer ga je tuinieren?

Hoe voel je je tijdens het tuinieren? (PrEmo)

Ga je wel eens tuinieren ook al heb je geen zin?

Hoe kies je uit wat je plant in je tuin?

Samen tuinieren

Tuinier je (wel eens) samen met iemand? Zo ja, met wie? Zo niet, waarom niet?

> ➢ Ja: Hebben jullie wel eens conflicten (ruzie, onenigheden) wanneer jullie samen tuinieren?

Voel je persoonlijk wel eens een conflict wanneer je aan het tuinieren bent/zijn?

Is er iemand met wie je graag wel eens samen zou willen tuinieren? Waarom tuinier je niet met die persoon?

Tuinieren je vrienden/familie ook? Zo ja, deel jij/delen zij wel eens tuinierervaringen buiten het tuinieren om?

Tuinieren & gereedschap

Welk gereedschap gebruik je normaal tijdens het tuinieren?

Is er gereedschap wat je vaak en graag gebruikt? Welk gereedschap is dit en waarom gebruik je het graag?

Activiteit:

Zou je mij je tuin willen laten zien en er iets over vertellen? Wat maakt je trots? Welke belevenissen hebben jullie gehad in deze tuin?

Verlangen

Fascinatie

Tevredenheid

Hoopvol

Trots

Bewondering

Vreugde

Walging

Verveling

Woede

Minachting

Schaamte

Angst

Droefheid

98

Datum	Fabienne Wijshoff
Contact persoon	f
E-mail	Gardening together - Enhancing the shared experience of gardening
Project titel	

TOESTEMMINGSFORMULIER

U wordt uitgenodigd om deel te nemen aan een onderzoek getiteld "Gardening together - Enhancing the shared experience of gardening". Dit onderzoek wordt uitgevoerd door Fabienne Wijshoff van de TU Delft in samenwerking met het bedrijf Talen Tools.

Het doel van dit onderzoek is om inzicht te krijgen in individuen die deelnemen aan sociale tuinactiviteiten om te ontwerpen voor welzijn. Deze sessie bestaat uit een interview, gevolgd door een opdracht van de onderzoeker en wordt afgesloten met een reflectiesessie. Het hele proces zal naar verwachting ongeveer 60 minuten in beslag nemen. De verzamelde gegevens zullen worden gebruikt voor analyse, verwerking en documentatie in het kader van het afstudeerproject van Fabienne Wijshoff. We stellen u vragen over tuinieren, uw relatie met tuinieren en uw ervaringen met tuinieren in een sociale setting. Ook wordt u gevraagd een rondleiding te geven in uw tuin.

De activiteiten worden vastgelegd door middel van notities, foto's en audio en de resultaten worden dienovereenkomstig gedocumenteerd. Alle verstrekte gegevens worden gebruikt voor analyse en gegevensverwerking. Alle identificeerbare gegevens, zoals toestemmingsformulieren en foto's, worden opgeslagen op een persoonlijke projectopslag, die alleen toegankelijk is voor de onderzoeker en het begeleidende team. Om de vertrouwelijkheid te waarborgen, worden alle gegevens geanonimiseerd, door middel van b.v. alle herkenbare kenmerken te vervagen en namen weg te laten.

Hoewel we maatregelen nemen om uw gegevens te anonimiseren, moet u er rekening mee houden dat er een klein risico bestaat op heridentificatie via externe gegevensbronnen. De bevindingen en gegevens verkregen uit dit onderzoek zullen worden gebruikt voor publicatie en openbaar worden gemaakt doormiddel van een master thesis. Daarnaast zullen de gegevens worden gearchiveerd in de TU Delft Master thesis repository om toekomstig onderzoek en leren te vergemakkelijken. De geanonimiseerde gegevens kunnen ook worden gedeeld met het toezichthoudende bedrijf voor referentie en gebruik.

Uw deelname aan dit onderzoek is geheel vrijwillig en u kunt zich op elk moment terugtrekken. U bent vrij om eventuele vragen weg te laten. Aangezien deze studie betrekking heeft op fysieke activiteit en interpersoonlijk contact, is het belangrijk om prioriteit te geven aan uw gezondheid en welzijn. Als u gezondheidsproblemen heeft of factoren die u in gevaar kunnen brengen, zoals kwetsbaarheid voor ziektes zoals Covid, verzoeken wij u vriendelijk af te zien van deelname aan het onderzoek. Houd er bovendien rekening mee dat als informatie die tijdens het interview wordt onthuld, wijst op betrokkenheid bij illegale activiteiten, dit juridische implicaties kan hebben. De aard en de ernst van dergelijke activiteiten zullen worden overwogen, en indien nodig kunnen de bevoegde autoriteiten op de hoogte worden gebracht, wat mogelijk kan leiden tot juridische gevolgen.

Tijdens de periode van dit onderzoek, dat is tot oktober 2023, kunt u een verzoek indienen om u terug te trekken uit het onderzoek.

Voor vragen na deelname kunt u contact opnemen met Fabienne Wijshoff via f.c.wijshoff@student.tudelft.nl.

TOESTEMMING

Ik begrijp de aan mij verstrekte informatie met betrekking tot het hierboven beschreven onderzoek. Ik heb de gelegenheid gehad om vragen te stellen en heb bevredigende antwoorden gekregen. Ik ga vrijwillig akkoord met deelname aan dit onderzoek. Door hieronder te tekenen, bevestig ik dat ik de informatie in het document voor geïnformeerde toestemming heb gelezen en begrepen, en dat ik vrijwillig mijn geïnformeerde toestemming geef om deel te nemen aan dit onderzoek.

Datum: _____

Handtekening deelnemer: _____

Datum: _____

Handtekening onderzoeker: _____

Interviews

Community garden – Moestuin "Achter de Horizon"

Interview 1 – A & B

Info: Students, 20y old, students "Architecture, Urbanism and Building Sciences"

Hobby's Interviewee A: Chess, rowing, cooking

Hobby's Interviewee B: Sports, reading, cooking

How often do you garden?

3x a week, sometimes every day – when there is nothing else to do quick visit to garden before or after other activities (leaving the house, 10min looking after garden)

- Watering plants
- Plating new plants (often start with planting a seed in a pot on the windowsill)

"Gardening in the open ground is so much more fun"

What do you like about gardening? What motivates you?

Nice place to be, **pleasant & sociable**, seeing plants grow gives **fulfilment,** also busy with garden outside of the garden (looking up what to grow & how)

What do you dislike about gardening?

Nothing

➔ Admit later that it's not that fun that people are not engaged in the activities that need to be performed together (keeping the common gardening areas kept)

Would you like to garden more?

Would like more space to garden, right now there is not more that can be done

Nice to see people, but also enjoy when it's calm

We are glad that we have the possibility to garden inside the city even if it's only a small space

How do you prepare for gardening?

Gardening books, "Moestuinieren op 1m²", step-to-step plan on how to grow vegetables, seeing gardening stuff on Instagram algorithm, aware that partition of vegetables needs to be different next time

→ Specifically looks up how to garden on small areas
→ Learning by doing

When are do you go garden?

Leave house 10min earlier, pass the garden by coincidence – go check it out, in the evening and morning on warm days, whenever you want to

Freedom to choose when to visit – motivation to visit is always present otherwise you wouldn't own a garden you pay for

How do you feel while gardening (PrEmo)?

Joy (like to do it), admiration, proud (proud of what we have achieved), hopeful (hopeful our plants turn out nice and communication within the garden committee will turn out better), content (plants are doing well), fascinated (when something grows, turns big), anticipation (sometimes get plants from others, wonder: what is it going to be?)

Guilty (don't feel like people who manage garden general parts are appreciated enough)

Do you ever garden even if you don't feel like it?

It sometimes only takes 5min to check on it or quickly water the plants and pull some weeds, not a big effort, is okay to do it

Doing it together makes it more fun

How do you choose what to plant in your garden?

Have seeds laying around by coincidence, taking advice from grandparent, like to plant different plants, not always the same, plant after discussing what to plant, but are very open on whatever will be planted, little space means getting plants that are usable, so vegetables and fruits mainly, flowers are already in shared part of the garden

Do you garden together? Why?

Yes, more fun together, roommates, both enthusiastic about gardening, were about to create their own garden when they stumbled upon the small garden next to their house

Own garden vs community garden: social part, learning from others, sharing knowledge

Do you ever have conflicts when you are gardening together?

Main conflict with shared parts of the garden, everyone seems eager to help, but time and the place they get assigned to doesn't seem to fit, not very flexible planning, about 40 people in one garden, awkward communication

Do you ever feel a conflict yourself when you are gardening?

No

Is there someone you would like to garden with? Why are you not gardening with that person?

Likes to show other people the garden, not that much to do, so including more people doesn't seem useful

Do your friends garden? Do you ever share gardening experiences with each other?

Yes, grandpa, mother, because they are also into it, sometimes people from rowing ask how the garden is doing, shares about it occasionally

Receive harvest from fellow gardeners – everyone likes to share a lot,

Tools

What tools do you normally use while gardening?

Tools that are shared for 10€ per year but it is doable, working with hands mainly, scissors from home and sticks and rope for plants

➔ Wide variation in definition of gardening tools

Are there tools you use frequently? Do you like these tools and what do you like about them?

Little shovel to make holes (small plants, not a lot of space, no need for bigger tools), gloves, water pump

"Watering can is our best friend"

Community garden – Tuincomplex "Delftse Hout"

Interview 2 – C

Info: Early retirement – Administration

Age: 55 years

Hobby's: Archery, hiking, sailing, learning new things

I garden with: Used to garden with wife

Description garden: Wild garden, doesn't really see anything as weeds → "bijkruid" ("side herbs"), everything has it's purpose, almost everything inside the garden edible (including what others consider weeds)

How often do you garden?

"Not that often" – 2x a week, sometimes only to harvest, 1h

What do you like about gardening? What motivates you?

you go back to the essence of life, complexity of society is far away from the primitive, mental peace, anchor point, garden helps you centre yourself, lose yourself, be and stay with yourself, have space to think, likes to try new stuff

What do you dislike about gardening?

weeding, sad to remove plants → right to exist, the usefulness, one of the healthiest plants in existence and we see it as weeds, taste interesting

What motivates you to garden? What are your goals?

Mutual respect to not let plants grow over borders, nowadays added value through diversity inside the garden, healthy, growing desirable plants for own use, can see a shift in the way people garden → more into biodiversity

Would you like to garden more?

Would like to have a garden like others have → Doesn't work but doesn't know why it doesn't work,

How do you prepare for gardening?

looks up online or in books how it fits, compost from home, ask in group if someone has something they would like to share with me, information from other gardeners

When do you go garden?

Whenever feels like it

How do you feel while gardening (PrEmo)?

Feel good, feel free, hopeful that plants will grow as intended, satisfied with when something grows, fascinated by everything that grows inside the garden, longing for more, for something to grow as it should grow, sad when something dies, "ik heb angst maar ik ben niet bang" → "I can feel scared but

I am not scared", wondering if everything will go right, more anticipation, ashamed → what could others think of my garden?, no boredom is a good sign, always something to do, disgust → disgusted with myself for using pesticide, very proactive in letting nature live, but mainly to protect oneself → only when physically threatened, like with wasps that were living in my hut some time ago and were threatening my son

How do you choose what to plant in your garden?

Looking at what fits, usefulness, chance of survival, uses opportunities when something is given for free, interaction between other plants & gardeners

Do you garden together? Why?

No, exchange with neighbours, lots of engagement and interaction via garden app group, being interactive with neighbours is nice

Do you ever have conflicts when you are gardening together?

sometimes conflict with the neighbours, if the weeds grow too far, saddle people with problems, not socially good, respect is important → keep an eye on the value of others, it's about taking and giving, hopes that by being respectful, others also being respectful to others, not necessarily to oneself, has something spiritual → it's a bit like for the love of god kind of thing

"There is a group of people who are into biodiversity who *are* happy with the state of my garden"

Do you ever feel a conflict yourself when you are gardening?

"Shouldn't I have done this differently" → just try again somewhere else

Is there someone you would like to garden with? Why are you not gardening with that person?

Do your friends garden? Do you ever share gardening experiences with each other?

Exchange plants with other gardeners, exchange knowledge, help each other out, like to help during community events

Tools

What tools do you normally use while gardening?

gloves, secateurs, hedge trimmer → there are requirements for the hedge that must be met - with an electric one it goes much faster, prong, shovel

Are there tools you use frequently? Do you like these tools and what do you like about them?

pruning shears → received from parents, has a nostalgic feel to it, gives a sense of sustainability as it has been passed down through generations

Interview 3 - D

Info: Retired - scientific researcher at "Sociaal & Cultureel Planbureau", authored articles and books, part of board of community garden

Age: Around 50

Hobby's: reading, drawing, painting, walking, crafts, making sculptures, creative hobbies

I garden with: My neighbours at home (borrowing their garden to garden in)

Description garden: Semi structured garden, some weeds growing along the sides, on the path, divided subsections with each corresponding plants inside, gardens in the garden of her home neighbours

How often do you garden?

3-4 times a week, 2 to 4 hours, sometimes a bit longer, depending on what needs to be done/other schedule of the day, always something to do, not just to sit (I sit only to take breaks)

What do you like about gardening? What motivates you?

look nice, not too wild, make the soil interesting, take control but also have surprises, grow food yourself, nice idea that you can see how it grows, it's a bit of an educational activity, lettuce is a treat, better than from the store ("bag"), picks what you need, leave the rest to grow, being busy with something, occupied with making something useful, physical relaxation, alternative to sport, relaxing, set mind to zero, nice that it is something else than comes out of the store

being able to have something for neighbors (the people that provide the gardening space), show that you respect them

What do you dislike about gardening?

that things can go wrong, unpredictability, all the beans eaten -> also funny to see how nature goes to work

Would you like to garden more?

no time to garden more, but you always see something to do

ABOUT THE EXPERIENCE:

How do you prepare for gardening?

think beforehand about what I'm going to grow, look it up (seeding calendar, booklets, online, ask others), sow at home, bring some things from home, like bring my lunch, seed library in the community garden → can take seeds, fun to do, can swap plants, also asking others what they have when I see something I like

When do you go garden?

/

How do you feel while gardening (PrEmo)?

sadness: if something goes wrong, also vandalism (also causes anger), joy: like that its silent, fascination: sometimes Im looking hypnotized at plants, seeing something grow that you didn't expect, can laugh at plants being eaten, like how birds do that with opening the beans, admiration: when something has grown quickly, pride: plants have grown big and bear fruit, it shows that you did something right, not very hopeful: everything that comes off is a bonus but I am not dependent on it, desire: I would like more harvest! Would like doing it like others because they are so successful, satisfaction: because of bodily fulfilment, you're feeling fulfilled, no shame: is not one's own garden, so you're not so attached to it

Do you ever garden even if you don't feel like it?

How do you choose what to plant in your garden?

doesn't ask things because then the neighbours have to think about it, decide for themselves, don't come out of it themselves because of modesty, would it do somewhat differently, furnish it differently, doesn't want to intervene since they have arranged it that way

Do you garden together? Why?

gardening together also important for enjoyment, a matter of personality, preferences here are very different, live and let live, share the garden → making a plan together is on the schedule, split up with watering, not talked about yet, doesn't mind listening to what someone else wants, harmonically, wants to split the garden more

shared garden, but does not want to intervene too hard in what the other person has determined

Do you ever have conflicts when you are gardening together?

Not here, sometimes people get in each other's way, a bit afraid of the neighbours shadow in their own garden, no other problems, some people interfere out of concern

Do you ever feel a conflict yourself when you are gardening?

Time goes by too fast → too much time spent on the garden, maybe help others more?, couldn't I have done something else if this wasn't a success after all?

Is there someone you would like to garden with? Why are you not gardening with that person?

Some people just slip into their yards

Do your friends garden? Do you ever share gardening experiences with each other?

Yes, talk to people with whom the garden is shared about strategies, imitate what other people have, many opportunities for exchange with other people inside the gardening complex, app group: find buddies who help & place where inquiries can be made

Rather talk 1 on 1, "they don't all have to know that I can't do it", don't want to come up with a silly question (shame), created different app groups for relevant calls

Tools

What tools do you normally use while gardening?

plastic bottles as a scarecrow - guessed/seen that that helps, nice that you can improvise like this in the garden, saw people put cardboard on the ground to improve the soil, didn't look nice, wouldn't do it myself, but result was astonishing, shovel, prong to stick out plants, hand hoe, hand rake, small scoop

Are there tools you use frequently? Do you like these tools and what do you like about them?

Big hoe old fashioned but useful, it requires rows to work with so the landscape would need some adjustment, maybe work on crop rotations with new permacultures, no electrical appliances: depends on garden owner - quiet vs practical (quick, could draw out structure a bit better with it)

Notes:

sometimes wonders: enough flowers for the bees?, being busy often shows that the garden is on purpose as it is (even if it is not 100% neat), rest periods is the selling point of the community garden

"Sometimes I wonder should I just let flowers grow because that is nice or should I work more on the structure of the garden for optimal plant growth of other plants?"

Interview 4 - E

Info: Retired - was a gardener, 62 years

Hobby's: reading, walking the dog, hiking in the mountains, listening to Bach, sailing

I garden with: Alone

Description garden: Very neatly structured, walking paths out of stone, little to no weeds, fence in front of hut to cover the view, greenhouse

How often do you garden?

3x a week, 4 to 5h, depending on appointments & tiredness

What do you like about gardening? What motivates you?

create order, time evaporates while gardening, daytime activities, feels good to be working, pleasure to see what has been done, nice feeling of being orderly, quiet & peaceful, can do anything, lots of privacy, "oasis of silence", abundance of impulses

enjoyment, silence, tranquillity, nature perception through sound and smell, cocoon of safety, "at home with yourself", more important than being able to eventually get those 3 potatoes out of the ground

What do you dislike about gardening?

Disposing of green waste, a lot of hassle → it's nice that it stays clean like this

Would you like to garden more?

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How do you prepare for gardening?

When do you go garden?

How do you feel while gardening (PrEmo)?

Admiration for the garden, sometimes boredom (it's been long enough now), nice to have a place for yourself, joy, not really proud - everything a bit self-evident, not really hopeful - sees it all happen and if it doesn't go well - too bad we move on, satisfied with how everything has turned out, fascination for nature, how everything grows and is able to produce something we can consume, disgust (porta potty to go to the toilet in the garden)

Do you ever garden even if you don't feel like it?

How do you choose what to plant in your garden?

just do whatever, 2x a year planting day, mint if they have, free in what you can plant, just grab something if there is something I like in the store

Do you garden together? Why?

wife doesn't like gardening (if she wants to come she has to indicate that first), this is really my place, daughter wanted an allotment garden (but doesn't really garden in it), can pass on experiences in the garden to others, being busy in the garden together lifts being together up, it makes being together more meaningful, privileged to be here in the garden

Do you ever have conflicts when you are gardening together?

Community positive vibe, app group, sometimes irritations about trees that cast too much shade, but don't make big deal out of it, still likes the person who has the tree, is considerate of neighbours

Do you ever feel a conflict yourself when you are gardening?

Shame with myself when garden gets out of hand because of too little discipline – able to show off garden now

Is there someone you would like to garden with? Why are you not gardening with that person?

Some people say "Haha you have a allotment garden" (cliché? something for old people?) – but this is just like a holiday park!

Do your friends garden? Do you ever share gardening experiences with each other?

 grant other people the experience too, make them aware of surrounding, mancave, your ego grows from this when others admire it, this is mine, I'm in control

Tools

What tools do you normally use while gardening?

secateurs, shovel, rake, hoe, spade, electric hedge trimmer, wheelbarrow, gloves, snickers pants, mat → jeans will still break

Are there tools you use frequently? Do you like these tools and what do you like about them?

garden shovel → you can do everything with it

recommend snickers pants → indestructible & tough

Interview 5 - F

Info: Non-working due to illness, former engineer student

Hobby's: hiking, puzzles, wintersports

I garden with: Parents, sometimes boyfriend, brother-in-law

Description garden: Structured garden with small grass perk in the middle, stone paths that lead around the garden, lots of flowers, greenhouse, little playground behind hut

How often do you garden?

5x per week, morning – midday, 3h on average

What do you like about gardening? What motivates you?

Being outdoors is nice – lived in a flat so having place with fresh air is nice, mindfulness, grounding, being busy with hands, designing things as you like, seeing cycles of the year more, experiencing seasons, can make it as intensive as you want, is a bit untidy in the back, learns things

Gardening like an experiment to me -> see what works, what doesn't work - gain experience this way, promote health, mental & physical positive improvement, beautiful if it is neat, colourful, if the grass is not mowed it is not a problem either, goal is that you can enjoy the garden, everyone can do their own thing, each piece is part of a whole, some social control, people with a low hedge sometimes want more privacy, but rules in the complex seem dynamic and adapt to the people in the garden, are drawn up by votes

What do you dislike about gardening?

Weeds & watering -> wouldn't really have to if it rained enough, spray water stinks because it comes from the trench, happy when it rains, weeding seems endless, proliferates too much, impossible to encounter, municipality stopped looking at cleanups even though we hire their grounds, annoying animals: mole destroys grass , pigeons shit everything

Would you like to garden more?

/

How do you prepare for gardening?

always bring food or drinks, dog always comes along, bring stuff depending on what I have lying around or need to do, take things with you, also for barbecue, don't wear your nicest clothes, today is not a good example haha, just do something -> sometimes see if it's possible or have to prepare for it another time

When do you go garden?

I go garden when it's nice weather, need to go outside, drive, also go when I want to finish a project, spend less time in the garden at the end of the year, bring a coat when it rains (no obstacle) or sit in greenhouse, greenhouse extends the year (can also just sit in it during the cold winter months) , for me gardening is an experiment, should not have too many expectations or you will get frustrated

How do you feel while gardening (PrEmo)?

no shame, does it reasonably well, sometimes ask for advice on what to do, not necessarily proud, if people like it a little bit, desire for everything to grow and work well, anger -> frustration about what is happening around, things that people have little understanding of (municipality removes bushes), sadness when a dog destroys something that works well or when you are just trying out something new

Extra question: Why this gardening complex?

shape of the complex, mature trees & accessibility, moved to be closer to the garden, extra garden at home, but it's smaller garden, does not generate extra work, holiday feeling, step away from your own daily environment, privacy, things you need in the neighbourhood

How do you choose what to plant in your garden?

Inspiration from parents plants, plant breeders: especially to get plants with dark leaves for variation in the garden, stronger plants there, just get whatever looks nice, some plants are blown in by wind, leave to see what comes out, sometimes get greedy: "I really want those and those", want to plant plants you haven't seen before, take inspiration from gardeners world -> look up plants they plant there, sometimes you have to give up things that don't work, but still tried a few times to plant a plant that wouldn't grow

Do you garden together? Why?

parents, friend, brother-in-law, sometimes go help other gardeners, sometimes they come here to help, when someone is on vacation you watch over your garden neighbors, the 4 gardens here are close together so feel like we have stronger connection, sometimes there are small things but then you keep talking and it becomes fun, you even invite each other over for a drink

Do you ever have conflicts when you are gardening together?

sometimes hear stories about neighbors who are impossible to talk to, used to have a shared garden but was thrown out so wanted a private garden, sharing a garden is actually not recommended, there are rules of the garden that there should be no noise on certain days and times but there is just noise around the garden from other people outside the complex, so find rule a bit strange

Do you ever feel a conflict yourself when you are gardening?

sometimes you get plants as a gift and then you have to find a place asap – always busy with putting the plants in the ground, sometimes things don't work and then you wonder why not and what you did wrong, but overall satisfied

Is there someone you would like to garden with? Why are you not gardening with that person?

Often fun with friends in the garden, sometimes they want to help (especially in the beginning) but then they say: "jeez what have you gotten yourself into ", often barbecue or lunch after help, in the end having fun here is the most important part

Do your friends garden? Do you ever share gardening experiences with each other?

Exchange plants with friends and other gardeners, garden book, exchange in the community: talking to others about plants, app group, many people understanding: they help each other and talk to each other

Tools

What tools do you normally use while gardening?

Spade, fork, shovel, battery lawnmower, generator for power, lidl battery tool set (can use battery on multiple devices), saw, electric hedge trimmer, secateurs, gardening gloves

Are there tools you use frequently? Do you like these tools and what do you like about them?

small garden shovel: you can do everything with it

Interview 6 - G

Info: about 60 years old, used to be teacher, now administrative work for Beursprogramma van Buitenlandse Zaken, originates from South-Africa

Hobby's: Hiking (hikes marathon's), biking

I garden with: Husband (follows command)

Description garden: Rather big lawn, tidy kept borders, some bigger trees, very neat hut

How often do you garden?

Garden a few times a week, in summer come almost every day, even if it is just to water, for an hour, create planning until when we will be busy, often agreed with my husband, always working, set own goals to where work will be done

What do you like about gardening? What motivates you?

It's a visually beautiful picture, there's always something to do, so never feel boredom, "to relax" means being busy in the garden, have a hammock for when to take a break or just enjoy the weather, having a garden is pure luxury, not everyone has this luxury

Always wanted to have large garden, enjoy being physically and mentally occupied, gives opportunity to be able to relax, having a place to rest and inviting family, more fun here than at home

What do you dislike about gardening?

sometimes it's overwhelming, so much weeding to be done, but it has to be done

Would you like to garden more?

How do you prepare for gardening?

Once ate this very specific paprika that was very tasty, looked up what sort it was so I could plant it myself, also look up online or in gardening magazines for advice, mainly go by intuition what needs to be done, fig trees for nostalgic reasons, common where I come from, homework for something you want, but also lot of trying, there is a plant dance between the plants

When are do you go garden?

weather dependent, is it nice enough that we can eat here or not, after work, in consultation with husband, don't have fixed days, really depends on what needs to be done

How do you feel while gardening (PrEmo)?

Like that this is a place to relax, nice challenge -> need more discipline with vegetables, joy: always say "This is my happy place" - "peace comes over me", pride: if I manage to make everything beautiful again, different feeling in the garden than at home, gratitude: that we can have this, this is not possible where we come from (feeling less safe there), "we have done nothing to deserve this and yet I have this" -> complex not expensive (600€ per year), sometimes people need to go to a park to have a different context around them -> with such a garden you have your own place for it, frustration: if you haven't been there for a while, after a vacation for example and weeds are

growing everywhere, desire: wish this was attached to the house: lacks electricity and running water (some allotments do have that), would have been nice if there had been (would really like a wood-fired outdoor pool), but: "you must have wishes & dreams", allotments along the railway had a different vibe than this one (this one feels cozier), setting of complex is beautiful, easy to combine with lifestyle, excitement: sometimes sleeping in the house, although it is not allowed, proud/blissful: "I also have a really nice garden", a picture that is correct, very visually oriented, loves grass and greenery, feels fresh

Do you ever garden even if you don't feel like it?

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How do you choose what to plant in your garden?

Opportunistic - I take what I can get, see lavender or something nice in the store, take it with me, tried several times to try the plant but it doesn't work -> it just dances so beautifully in the wind so I really wanted to try it, also see what is cheap, tried attempt at self-sufficiency: we thought we just try it out and see what does well, but we are not dependent on self-sufficiency

Do you garden together? Why?

Garden with husband, he carries out tasks, "I am the conductor", have an app group -> nice that you can exchange things, creates increased community feeling, more in your face than a newsletter, opportunity to get to know people, used to garden with mother, think board pays good attention to people, less socially involved in community due to work, miss the commitment to participate in the social activities of the community

think it's nice when you can hear people inside the garden, sometime even thinks it's too quiet -> could be a bit more lively, to get the feeling of where I come from: "I would let them have their swimming pools and trampolines"

think it's great that there is a lot of self-initiative, love exchanging with people -> love social contacts, restricted due to lack of time

Do you ever have conflicts when you are gardening together?

barbequing at home would be a nuisance and does not want to be a nuisance to people, garden perfect place to do so, would give up garden if barbecuing was not allowed, neighbour's weeds sometimes enter the garden but it is what it is, don't mind removing it myself

Do you ever feel a conflict yourself when you are gardening?

yes, therefore like to work together, make decisions about the garden together, set priorities in the garden of what needs to be done, at home you have more control over it because you come there every day, borders must be perfect, make demands on myself, it is nice if you are slowed down, otherwise it would be too overwhelming, balance needed when gardening

Is there someone you would like to garden with? Why are you not gardening with that person?

children do not want to garden, but do like to be in the garden, children do like plants, once had a fig tree that got claimed by one of my children, that when she has space it is her fig tree and she will get it for her own home, have plants themselves at home, sometimes exchange plants with children, people around me know that there is an interest in gardening, so if a gift is appropriate, then a coupon from the intratuin

Do your friends garden? Do you ever share gardening experiences with each other?

Informal exchange over the hedge, greet each other, exchange with friends and family -> surplus of vegetables from sisters, they have vegetable gardens of their own

Tools

What tools do you normally use while gardening?

garden subsoiler "couldn't do without", shovel, rake, hoe, hand shovel, gloves -> especially easy and better for your hands if you are busy for a long time, but don't mind getting hands dirty

Are there tools you use frequently? Do you like these tools and what do you like about them?

hand shovel, take carrots, edge cutter, subsoiler, petrol lawnmower -> goes faster, electric you have to start the aggregate first, too much of a hassle

Interview 7 - H

Info: Hearing care professional – retired, 63 years old

Hobby's: cycling, traveling, reading, movies, talking to people

I garden with: I garden alone

Description garden: Neat garden, small grass field, plant variations, generally well maintained, couple of containers falling apart, structured hut, greenhouse, hasn't been in the garden for a long time yet

How often do you garden?

3 to 4 times a week, sometimes just to sit, 1 to 2 hours of gardening, depending on what needs to be done

What do you like about gardening? What motivates you?

Like being busy in the green, it's amazement to see what is happening in the garden, "everything is possible, but nothing has to be done", the garden used to have to be done in the weekend, there was no time at other times, not everything can go right immediately, you have to adjust the sense of perfectionism in the garden, try to be free, copied from nature itself

allows you to be wild, but also write down goals, priorities, requires self-direction, but also important that you have freedom to do what you want

What do you dislike about gardening?

animals that are harmful, caterpillars or other bugs are eating all the apples from the tree, it is a shame, don't really know what to do about it, but also don't want to put too much effort into putting nets on the tree, think weeding is zen, can set your thoughts to 0 and be busy, don't really know yet, maybe pruning because don't know how to do it yet, house maintenance a lot of work - could have been smaller to own preference

Would you like to garden more?

a little bit of doing everything is fine, there's too much from previous owner that haven't discovered yet, bit overwhelming, can't do that much yet, curious what's will happen

How do you prepare for gardening?

Look up how to care for plants, ask others, use google lens, bring food & drinks, gardening clothes are already there, tools are already there from previous owner

When do you go garden?

Usually on Mondays, around all other appointments, it's very spontaneous, lives in the middle of the city and the garden is cooler, comes here especially when it is hot, was not aware of this at first, registered with garden complex when I started having more time: lucky with the garden, exactly what I wanted -> well-kept garden: so an entry & ready garden

How do you feel while gardening (PrEmo)?

fascination with how things grow & the critters, satisfaction/admiration: the place is nice, garden looks nice, hopeful: that there will be some nice grapes (brother knows all about grapes, proud to show him what is coming, how well the grapes are taken care of), pride: that the grapes are doing so well, something to show, joy: garden is a nice place to be itself, sadness: apples being eaten by bugs but don't like to disturb nature with nets etc. -> "doing is more fun than the result", "sometimes wonder: am I really a gardener or a garden sitter?", doesn't really want to put in that much effort, "actually I still have to do this and do that, but the need to do it is less bad (almost no obligations in my own garden in addition to my own goals)", excitement: nice to sleep here, although it's not really allowed, enjoy peace (a little bit of noise is okay, but no children's screams), nice place to let off your energy, fear: behind the facts run out when things are delayed too long

Do you ever garden even if you don't feel like it?

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How do you choose what to plant in your garden?

"it has to be tidy" - garden is an investment you make, a bit messy is nice, looking at what is still growing, think sunflowers nice plants, so planted them, sown hollyhocks, tomato plants, think something like this just belongs in a greenhouse, nice you can grow something edible yourself, interesting to see what happens to the plants, sometimes see what others have and think "I want that too"

Do you garden together? Why?

Brother, parents did gardening, don't get around to talking to others yet, since still relatively new in the garden, see that there is an exchange, if you ask something in app group help will arrive within 10 minutes, want no obligations for a while, just finished working, now retired and time for yourself, plan and try to be more socially involved next year

Do you ever have conflicts when you are gardening together?

too young for New Year's reception, likes peace -> here can ask people if they want to come by on Sunday because it's quiet

Do you ever feel a conflict yourself when you are gardening?

I don't really know what to do, but fun and exciting, "I'm a beginner, how can you make mistakes?", nice to have a garden again, although it was nice to have nothing in between as well, still kind of missed it, since this is a place to escape to

Is there someone you would like to garden with? Why are you not gardening with that person?

Nice to have own power over garden, no one interfering and bossing around like how it used to be during work → "This is my own realm"

Do your friends garden? Do you ever share gardening experiences with each other?

Brother tells how to do it and looks a bit after plants with me, parents had a gardening business, thought I had learned something but actually all I only did was harvesting tomatoes for example

Tools

What tools do you normally use while gardening?

Hand mechanical lawn mower, scissors, electric hedge trimmer, don't know what half the tools are for, rake, hoe, shovel, verticulating machine (not yet used)

Are there tools you use frequently? Do you like these tools and what do you like about them?

Nice that the previous owner left things behind, tree clippers very nice, scissors and pruning shears, want to have tools that are practical and durable but also easy and manageable with a safe feeling

Interview 8 - I

Info: about 66 years old, retired – worked at children's daycare

Hobby's: None

I garden with:

Description garden: At first glance unstructured, self-made structures for vegetable garden, small river, lot's of high trees and hedges, small hut, path through the garden, improvised fencing and hedges, sit circle made from leftover cut's

How often do you garden?

2 to 3x a week, all day, opportunity if I'm already in the area, go and water a bit

What do you like about gardening? What motivates you?

Be in charge of everything, don't take anyone into account, but keep to the rules, the neighbor sometimes calls out what needs to be done, let everything in the garden happen a bit

Pleasant being busy, no landscaping plan

What do you dislike about gardening?

No grip on beautiful lawns & weeds, busy with weeds all day, takes up a lot of time, wants 50/50 relaxation & work, can cut & prune all day, spend days on pruning

Would you like to garden more?

Technically not enough with 2 days a week, but garden is far away from home

How do you prepare for gardening?

Info from books, remember what I read, also have a subscription to garden magazine, usually make plan for vegetable garden, often the day comes naturally, only when I'm here see what to do, many gardens where people garden "together", but the woman says what needs to be done, just freedom here

usually manage to get through the day, bring food and drinks from home, make sure you have something so you can take a break, bring for example a book, sometimes have to stop yourself, but then I wonder: why go home already? I am home alone, decide some things at home: hang up the bin today, but often want to do things that require help, enthusiastically start vegetable garden in February, it's sort of a new beginning and I think I did not completely fail this year, wouldn't want to leave vegetable garden out, it's like a sport

When do you go garden?

Depending on the weather, when I feel like it

How do you feel while gardening (PrEmo)?

Contempt: people get upset that they receive comments, consult board about various matters -> discovered late that this was possible, nagging about the hedge, it seems as if the neighbor does not really have a garden to enjoy, joy: exciting what comes out of the garden, "the garden is the boss",

pride: well done what I do, feel satisfied with what I do, fear too big a word: very bad when you hear what you need to do in your own garden from the board, frustration about things that have to go, but they do not give a solution for people who do not have the capacity to get rid of prunings, you do not want to receive comments about the garden, you put work into it that is not appreciated, fascination/admiration: joy that it works and does it well, no shame: many things that could be condemned can simply not be done if you don't have time, would like it differently but just can't, but it must remain fun and therefore should do it when it suits you

Do you ever garden even if you don't feel like it?

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How do you choose what to plant in your garden?

I choose flowers by colour, vegetable garden depends on critters, lettuce just doesn't work with all those snails, plants/seeds from children and the seed library at the canteen, no plan, "I succumb to the possibilities in the intratuin", try to pick something that can stand for a long time so that it doesn't have to be looked at much, can't steer it in the end

nice when something different grows every year, changing vegetables, cleaning in autumn, used to think it was a shame to remove things and the consequences are now noticeable: I need to do extra pruning, always come and check immediately after a storm because of all the big trees, if someone is not there for a few weeks then it indeed goes wild, tries to keep it light, shrubs and flowers much more fun, vegetable garden is almost always eaten, a pity that it doesn't work out but I don't mind, not dependent on it, still think that a vegetable garden belongs to such a garden

Do you garden together? Why?

nice if there were more reasons to help each other, many people like to be alone in their own garden, some don't like it when you suddenly walk into their garden, experienced it when I go around to turn off all water taps in winter to make them winter safe, it would be nice if people ask for help and that you could help each other more

Son helps because some things just aren't doable alone, children live far away so they come for chore days, but they like doing it, it's fun for them

app group is better than going around begging people for help, it's like a replacement of a bulletin board with faster communication, would probably be smoother if multiple people were working on such a garden, together would be nice especially if you get along well with someone else

Do you ever have conflicts when you are gardening together?

Would like the garden association to prune hedges, often busy with it because otherwise they will complain, felt oppressive, people used to determine how the garden should look, communication was terrible -> very often deadlines until when something had to be done, only day a week that you have free time, want to do what you want and decide for yourself in the garden what happens instead of pruning all Saturday and Sunday, its now better, people consult and talk more with people about the state of the garden

you don't want to have to explain everything, such a garden is a lot of work, you should leave people who put a lot of energy into such a garden alone, closed off seems nice at first because you then have your privacy, but over time you notice that it is not fun at all because you do want to say hello

to people, you would feel more locked up if the garden has grown over, it's very quiet in the complex, sometimes wonder "where is everyone now?"

Do you ever feel a conflict yourself when you are gardening?

Letter "your garden seems to be overgrown", which nowadays is good for nature, neighbor thinks everything is done wrong in own garden, sometimes gets zucchini from neighbor because she is very successful in her way of gardening, wouldn't want to have such a garden myself though

don't know what to do with prunings, no way to get rid of them, do a lot of recycling of stuff in the garden, don't necessarily do some things because it's fun, but you just don't know what to do with them, so things are born out of necessity, day goes by very easily which is good, but also not good if you have a busy job with very little free time, sometimes need to hold yourself back because it's so long and far to cycle, no money for a garden closer to home, has become attached to what's in the garden, don't want to give that up

Is there someone you would like to garden with? Why are you not gardening with that person?

Want to help, should ask, for example neighbor with house that hasn't been built yet, clearly see that man prioritizes vegetable garden above everything else, nice that through the app you find out someone's name, don't just walk into someone's garden, think people are just here to be alone, wave when someone comes by

door of the DIY club is not wide open, would like it if there were more things like sharing tools or people coming to repair something, now works better with the app, people who used to have a garden still come to the garden complex to work in / on the club house

Do your friends garden? Do you ever share gardening experiences with each other?

Neighbor meets in the middle, no conflict with neighbour, maybe she's a bit irritated from weeds growing over, she put a net over it so it doesn't bother her anymore, have a bit of a bossy neighbor, likes that neighbor is doing well, "actually no idea why I don't do it the same way", I think it should be that way, but garden is for doing what you want, holy place, letting it happen is the most important thing, some people do it to save money, if you do it right you get a lot out of it

Tools

What tools do you normally use while gardening?

small battery lawnmower -> sufficient for small lawn, hoe, uprooter, shovel, hedge trimmer, pruning shears, telescopic pruning shears is very handy, chainsaw (son), buy a lot of things on battery

Are there tools you use frequently? Do you like these tools and what do you like about them?

hoe, using tools which I can clean with

Pot gardeners

Information participant:

Age:

Occupation: *Student*

Relationship with researcher: *Friends*

Hobby's:
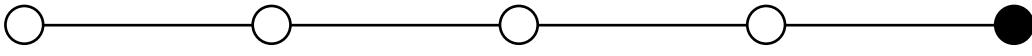
General interest in gardening: *Yes / No, does like to be outside*

Questions towards gardening:

Have you gardened before? E.g. do you own plants?

Answer: Depends on scale of gardening, use little pots, bigger pots, owns plants, 5 plants

If you garden, how often do you garden? And how long do your gardening sessions normally last?

Answer:

Never   Sometimes   Regularly

Daily, weekly, they are cute, feel sad when it doesn't work out, temporary tenant, will not myself buy plants, friends give me presents

Do you like gardening? If yes, what do you like about gardening?

Answer: Likes it, friends wouldn't give it, if she didn't take good care (would like to show me)

Plants are life, they will cry if I throw them away, likes to see results, chooses plants you do not to water everyday

Wouldn't see it as a lot of effort

What do you dislike about gardening?

Answer: When leaves turn brown (feel guilty), takes more effort and makes room dirty, have to give yourself a push to do it, unsure if I do it correctly or not, doesn't mind getting dirty hands

What initiates you to go garden?

Answer: Saw plant at friends garden, thought it was cute so also wanted to have it, wants room to be lively, pretty

Gardening experiences

How do you prepare before you start gardening?

Answer: looked up youtube video about taking care of plants, ask seller what to do with plants, friends opinion, buy pots, buy shovel, just small plants

What do you feel when you are gardening? At what stages do you experience which emotions?

Answer: Doesn't care that much if something die, try yourself,

Gardening & friends

Do you generally garden alone? If not, who do you garden with?

Answer: Does this alone, would ask for help boyfriend if needed, roommates if had a garden, turn garden into beautiful one together, use gardening to distract from bad mood alone, if someone else would be involved it would be more chaotic

Do you have friends that like to garden? If yes, do they ever share about their gardening experiences with you (e.g. happy a plant has started growing, etc.)?

Answer: First time she went to friends house, friend directly showed garden, told her about gardening plans, shows her interest in the plants, relatability

Has a friend ever invited you to garden with them? If not, why do you think they haven't?

Answer: Culture thing, garden is good to with husband, for friends is to show results, maybe their neighbour?, if people have similar garden with similar plants they might swap knowledge

Who would you like to garden with?

Answer: Boyfriend, gardening more of an individual thing, but didn't try gardening together before

Gardening & tools

What utensils would you normally use while gardening?

Answer: has a shovel & scissors, measuring cup to water it

Are there tools you frequently use? What are those tools? And what do you like about those tools?

Answer: colour, ergonomics, have a lot of dirt on it at once, smaller might be better for smaller plants, doesn't want to buy more tools because of moving, etc.

Notes:

Mom told her to help with gardening when she was younger, atm dad helping mom

Notes during the shared gardening experience

<u>Observations:</u>

Activity	Emotions/Experience	Quotes	Comments
Took the plant out of the plastic	Panic/Insecure – its alive in my hand and I don't know what to do with it - excited		
Looked into pot and question if the original should be removed	Bit shameful that I didn't know what to do		
Suggested to take it out of the small container because of the roots	More confident – confident after getting advice from friend		
Used shovel to put dirt in the bottom, make it more suitable for the height of the flower	Not sure how much dirt should be put inside, look for affirmation with friend if it is enough		
Add water in the bottom	Confident, knew more about the dirt than friend		
Taking out plant	Nervous – look for affirmation again, a bit too careful, afraid that she will hurt the plant	*"The dirt is really loose"*	
Friend grabbed greens	Surprised in a good way	*"Oh I can do it like that next time"*	
Friend loosen roots	Astonished, comfort, feels like the plant can breathe	*"New thing that I learned"*	
Put it in the pot, measured height and put more dirt inside	Relieved, that someone is helping	*"More convenient when you do it with multiple people"*	
Pressed dirt on			Unsure whether dirt will combine well together
Cleaned table			Saving resources
Done	Everything is settled down – beginning is nervous in the end a bit burdensome, but also happy that she gets to keep the plant and she's done		Insecure if it will live good, more responsibility will have to take care of the plant

Interview 10 - K

Information participant:

Age: 24

Occupation: *Student*

Relationship with researcher: *Friends*

Hobby's: *Dancing (pole), chilling with people (friends), watching series*

General interest in gardening: *Yes / No, does like to be outside*

Lazy, no garden, but if I had a garden there would be a possibility, I used to work in the garden on the initiative of mother

Questions towards gardening:

Have you gardened before? E.g. do you own plants?

Answer: Buys plants ready to go, received a baby cutting from father, is asked by father after, does not know how to deal with plants, has an aloe vera (knows which plants she has), "afraid that my babies will die soon"

If you garden, how often do you garden? And how long do your gardening sessions normally last?

Answer:

Never — Sometimes — Regularly

Buys plants myself, wanted to make the room more exciting, "dress up the room, it was a bit boring and white and sterile"

Do you like gardening? If yes, what do you like about gardening?

Answer: Plants are nice, "if someone would give this to me I would be very happy" "people don't associate plants with me"

What do you dislike about gardening?

Answer: hate it when my hands get dirty, sand feels very dirty, gets between nails; watch out that there isn't sand everywhere, if you have a garden it's a different story, here it's annoying, afraid things will die if I pot them into a different pot

What initiates you to go garden?

Answer:

Gardening experiences

How do you prepare before you start gardening?

Answer: depends on the setting, being home alone, looking up online how (wikihow) things you shouldn't do and things you shouldn't do, ask someone, do it with someone, often more people in the house have to do it (then we plant them together), someone was busy so I just joined in

What do you feel when you are gardening? At what stages do you experience which emotions?

Answer: buying a plant – feel responsible (It's my plant, so I have to carefully select) you have to take care of it, bought at a sale, sold cheaper plants, maybe plants weren't that good anymore (doubts), "oh I want those!" at albert heijn, because I sometimes work there, garden center bought some of those mini plants, at the AH slightly less good quality, feel like they die faster, colleague shares info that you have to replant then they last longer (information from colleague), 2 plants from a market (they were very cheap, were outside, bought around winter, exciting whether they would survive - hardly believed the price), just nice "oh I want more plants" must have room for them – not going to buy more plants because I have no place - don't know where I should put them

Gardening & friends

Do you generally garden alone? If not, who do you garden with?

Answer: Does it when someone else is busy (does it very rarely) - when it comes to being really busy then never do it alone - "don't really know what to do"

Friend's father brings trees to life – "very funny"

Mother redesigned garden with landscape architect (because the garden is nice, it is nice to work in the garden) - "nice garden to sit in" - satisfying feeling - proud of our garden

Father wants to plant more but does nothing – confused why

Sees that neighbor has weeds in garden – little conflict with neighbors – strange man, we don't like him

Do you have friends that like to garden? If yes, do they ever share about their gardening experiences with you (e.g. happy a plant has started growing, etc.)?

Answer: Yes, mother, she wants the garden to look good - for herself and to present to others

Sometimes talk to people about plants - if you see plants in a room you comment on them

Maybe not noticed yet – but think that many people are proud of their plants

Has a friend ever invited you to garden with them? If not, why do you think they haven't?

Answer: Friend asks if you want to repot a plant, no, we do that together

Gardening – don't really think it's something I think you're going to do together – "your plants not your guys plants" – with boyfriend "later these will be our plants" "wow is really cool if we put all our plants together later"

I wouldn't ask myself but I would do it for others

Who would you like to garden with?

Answer: Boyfriend; with my dog (then you have someone with you), with dog just cozy, but in a different way

Gardening & tools

What utensils would you normally use while gardening?

Answer: None, because does it so little, used to be fun to use a hoe as a child, don't have gloves but would find it more chill to pot plants with them, we used to have them (because then hands stay clean)

Are there tools you frequently use? What are those tools? And what do you like about those tools?

Answer: /

Notes:

Notes during the gardening experience

Observations:

"Ashamed that I don't know that much", "gardening together, yes, yes that's nice"

Activity	Emotions/Experience	Quotes	Comments
Take stuff and go outside	Awkward/Out of place		
Put on gloves	Protection from nasty feeling	*"Oh they look fun!"*	She liked the gloves so that made it more fun
Dirt into pot	Knew she had to do that but unsure about it	*"Don't know how much"*	
Squeeze the pot so roots come loose		*"The moment you started helping I became more confident"*	Advice I had given to her
Loosened roots	Stupid that I didn't know how to do it, a little scared that I will break it, nice to give out of hands because otherwise I would become unsure/insecure again	*"Wouldn't you break it like this?"*	I did this action
Made groove in dirt to put the plant in			
Put plant in pot			
Put dirt in with the hand shovel			
Put dirt in with the old pot the plant used to be in	Admiration	*"Oh dat is wel handig"*	
Press dirt			
Clean pot from dirt on edges	Satisfaction		
Clean everything			
Wash hands	Slight disgust	*"Things that hold me back, but once I do it is what it is + can quickly wash hands here"*	
Show plant proudly	Proud, happy with new gift		

Homeowned gardeners

<u>**Interview 11 - L**</u>

<u>**Information participant:**</u>

Age: 29

Occupation: Landscape architect

Relationship with researcher: Friends

Hobby's: Painting, handicraft, sewing, Waldjugend (scouting), Schützen (marksmen's club), walking, biking
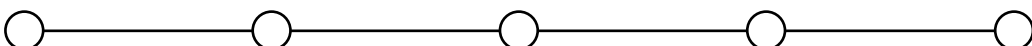
General interest in gardening: Yes

Questions towards gardening:

Have you gardened before? E.g. do you own plants?

Answer: Yes, you can say so

If you garden, how often do you garden? And how long do your gardening sessions normally last?

Answer:

○────○────○────○────○

Never   *Sometimes*   *Regularly*

If you have time, on weekends, water plants more often than only on weekends, depends on the task 2 to 3 hours depending on how long you haven't been there, how much weeds grew

Do you like gardening? If yes, what do you like about gardening?

Answer: Like planting new plants more than weeding, although weeding can be meditative, a fresh, new, different experience of success, bringing in new growth, a bit of change, not always the same, if there are plants in the bed that die, see what works better at what location, plants change, never the same appearance, rethink/think differently

What do you dislike about gardening?

Answer: The stooped posture when weeding, taking away what you have collected from the bed, disposal, bins are always too small, neighbor's cat poops in the plant bed when neighbor's plants grow over and he doesn't cut them, it's strenuous, the timing doesn't fit any differently, days are too busy, happy when you've managed to work in the garden for so long

What initiates you to go garden?

Answer: You want it to be nice, to feel good, to have a representative character, to make it look nice for others, to show what you have learned from a professional point of view, not just to have a title, to go into the plant bed, buy something new for it, give bed time to change, not get something new straight away, only if something needs to be replaced, after work "oh, there is something here" then you pluck something out

Preferably: pruning trees, plant nursery, creating order

Gardening experiences

How do you prepare before you start gardening?

Answer: Get work trousers, old clothes, work utensils, Airpods charged, listening to music

What do you feel when you are gardening? At what stages do you experience which emotions?

Answer: Frustration, because you can see how much work is still ahead of you, proud of how much you have accomplished, happy when you have planted something nice – 19:19

Gardening & friends

Do you generally garden alone? If not, who do you garden with?

Answer: Sometimes with my brother (it's officially his garden), mostly alone because that's how it works out in terms of time, together it's more motivating, together you can do a little more and longer than alone, having someone there also helps, you are not sitting there alone and seeing the whole work that is in front of you

Do you have friends that like to garden? If yes, do they ever share about their gardening experiences with you (e.g. happy a plant has started growing, etc.)?

Answer: Exchange what works well, proud to show, not everyone is lucky enough to have a garden, balcony is faster so taking care of plants there is easier

Has a friend ever invited you to garden with them? If not, why do you think they haven't?

Answer: Mom, both in her garden and in mine, she wanted to do something so she asked if she could help

In my own garden, I prefer to be there myself, other care differently, might tear out the wrong plants

Better to be alone, just enjoy the peace and quiet, gardening means that you can recap the week, when you don't otherwise have too much time, to think a lot while gardening, think about everything

Who would you like to garden with?

Answer: With brother, mom talks a lot, both have advantages and disadvantages, you can let your mind wander, even when other people are around when people are quiet

Gardening & tools

What utensils would you normally use while gardening?

Answer: Cultivator, to loosen up the bed & get weeds out, spade, depending on which weeds have strayed, sweep out rakes for leaves, rose shears, pruning shears, shovel for smaller roots

Are there tools you frequently use? What are those tools? And what do you like about those tools?

Answer: Cultivator, used the most in terms of covering a lot of area

Room for extra questions that come up:

How do you decide what to plant?

Answer: How the soil is, how the sun is, go to the plant center, don't/can't always take exactly the ones you would like because you have to take what's available, brother agrees with everything, relies on what she knows and what can be planted

Notes during the gardening experience

Observations:

Activity	Emotions/Experience	Quotes	Comments
Take plant out of package	Joy, small actions that bring something nice always bring joy	*„Actually, every plant has something beautiful"*	
(Take receipt out of pot) Dirt into the pot	Confident, knows what she's doing, aware of what she's doing		
Researcher helped with putting in dirt	Felt supported, found it nice		
Tear roots apart	Expertly		
Wet dirt	Didn't feel bothered by it	*"I don't really mind, can wash my hands afterwards"*	
Put plant into the pot			
Too little dirt in the pot	It wasn't bad, I'll just fill it up again, it was expected	*„It's always a trial and error whether it fits or not"*	
Pressed more dirt into the pot			
Cean up	Wonderful, you could sweep the table a bit with your hands, spread the remaining soil in other beds so that nothing was left, satisfied		
		"Wherever you could help, you helped!"	

24 Universal Human Goals

This infographic provides an overview of 24 universal human goals clustered according to the work of Ford and Nichols (see page 88–89 in Martin Ford's 1992 book 'Motivating Humans: Goals, Emotions, and Personal Agency Beliefs' by Sage Publications). The terms and definitions on this infographic are directly taken from this reference.

desired person-environment consequences

SUPERIORITY
(Power, Prestige, Authority, Dominance, Popularity)
Comparing favorably to others in terms of winning, status, or success. Avoiding unfavorable comparisons with others.

RECEIVING
(Resource Acquisition)
Obtaining approval, support, assistance, advice, or validation from others. Avoiding social disapproval or rejection.

AUTONOMY
(Self-Determination, Freedom, Self-Direction, Independence)
Experiencing a sense of freedom to act or to make choices. Avoiding the feeling of being pressured, constrained, or coerced.

UNIQUENESS
(Individuality)
Feeling unique, special, or different. Avoiding similarity or conformity with others.

GIVING
(Resource Provision, Showing Care, Benevolence, Kindness, Altruism)
Giving approval, support, assistance, advice, or validation to others. Avoiding selfish or uncaring behavior.

BELONGING
(Relatedness, Connectedness)
Building or maintaining attachments, friendships, intimacy, or a sense of community. Avoiding feelings of social isolation or separateness.

EQUITY
(Fairness, Universalism, Justice, Honesty, Integrity)
Promoting fairness, justice, reciprocity, or equality. Avoiding unfair or unjust actions.

(SOCIAL) RESPONSIBILITY
(Conformity)
Keeping interpersonal commitments, meeting social role obligations, and conforming to social and moral rules. Avoiding social transgressions, and unethical, immoral, or illegal behavior.

MANAGEMENT
(Efficiency, Productivity, Order, Organization)
Maintaining order, organization, or productivity in daily life tasks. Avoiding sloppiness, inefficiency, or disorganization.

MASTERY
(Competence, Excellence)
Meeting a challenging standard of achievement or improvement. Avoiding incompetence, mediocrity, or decrements in performance.

MATERIAL GAIN
(Financial Security)
Increasing the amount of money or tangible goods one has. Avoiding loss of money or material possessions.

CREATIVITY
(Self-Expression)
Engaging in activities involving artistic expression or creativity. Avoiding tasks that do not provide opportunities for creative action.

SAFETY
(Security, Control)
Being unharmed, physically secure, and free from risk. Avoiding threatening, depriving, or harmful circumstances.

HARMONY
(Unity, Devotion)
Experiencing a profound or spiritual sense of connectedness, harmony, or oneness with people, nature, or a greater power. Avoiding feelings of psychological disunity or disorganization.

TRANSCENDENCE
(Flow)
Experiencing optimal or extraordinary states of functioning. Avoiding feeling trapped within the boundaries of ordinary experience.

desired within-person consequences

BODILY SENSATIONS
(Physical Pleasure)
Experiencing pleasure associated with the senses, physical movement, or bodily contact. Avoiding unpleasant or uncomfortable bodily sensations.

CONTENTMENT
(Happiness)
Experiencing feelings of joy and satisfaction. Avoiding feelings of emotional distress and dissatisfaction.

ENTERTAINMENT
(Fun, Excitement)
Experiencing excitement or heightened arousal. Avoiding boredom or stressful inactivity.

PHYSICAL WELLBEING
(Health)
Feeling healthy, energetic or physically robust. Avoiding feelings of lethargy, weakness, or ill-health.

TRANQUILITY
(Being Carefree, Relaxation, Comfort, Calmth)
Feeling relaxed and at ease. Avoiding stressful over-arousal.

POSITIVE SELF
(Self-Esteem)
Maintaining a sense of self-confidence, pride, or self-worth. Avoiding feelings of failure, guilt, or incompetence.

EXPLORATION
(Curiosity)
Satisfying one's curiosity about personally meaningful events. Avoiding a sense of being uninformed or not knowing what's going on.

UNDERSTANDING
(Knowledge, Sense-Making)
Gaining knowledge or making sense out of something. Avoiding misconceptions, erroneous beliefs, or feelings of confusion.

INTELLECTUAL STIMULATION
(Intellectual Creativity, Novel Thinking)
Engaging in activities involving original thinking or novel or interesting ideas. Avoiding mindless or familiar ways of thinking.

environment

12.7 APPENDIX H – Statement cards, sub-themes and clustering

All the statement cards can be viewed under the link:

https://miro.com/app/board/uXjVNEdkgnI=/?share_link_id=955119180350

12.8 APPENDIX I – 10 Dilemmas

Detailed description 10 dilemmas:

1. I want to do what I want when I want and only consider my own needs, but I also want to be social by helping and interacting with other, creating social connections.

During the interview, participants expressed their desire of wanting to help others, for example during community events or looking after a neighbours garden when they are on vacation. They do not necessarily expect beneficial actions in return, but rather want to focus on doing good and creating social connections with them. However, although participants want to help others, they would also like to achieve their individual goals and manage their gardens according to their own schedules. Most participants claimed to have little time to get tasks done and would prefer to spend time on their own priorities first.

["I can be in charge of everything and don't have to take anyone into account, but keep to the rules"; "I want no obligations for a while. I just finished work so now I'm retired and have time for myself"; "I want to help. I should ask for example my neighbor with a cabin that hasn't been built yet. But I clearly see that the man prioritizes vegetable garden above everything else"]

2. I want to have what others have because they are successful, but I also want to be unique and successful.

Participants claimed that they aim to be as successful as others; they often see the success of others and aspire to achieve the same level of accomplishment. However, participants also noted that even though they want to be successful through the same means as others, they would prefer to be successful by doing their own thing and planting unique plants. So while participants seek a level of achievement similar to those of others, they also value being unique through their own accomplishments.

["I would like to have a garden like others have. For me it doesn't work but I don't really know why it doesn't work"; "I imitate what others have, because that seems to work"; "I want to plant plants you haven't seen before"]

3. I want to have imperfections inside my garden to be able to enjoy it, but I also want my garden to be flawless to be able to enjoy it.

Being able to enjoy your garden through it being not entirely neat and orderly is one desire participants expressed. They value and find joy in letting their garden flourish by itself, for example being able to enjoy when the grass is not cut perfectly. However, participants simultaneously expressed that they expect from themselves to achieve a neat and tidy garden. They express that they prefer to create order and want a visually pleasing state of their garden.

["My goal is that you can enjoy the garden. When the grass is not mowed that is not really a problem"; "I am very visually oriented, I need a picture that is correct"; "I like to create order"; "It has to be tidy, the garden is an investment you make"]

4. I want to let the garden grow by itself and be surprised by what it has to offer, but I also want to be satisfied with myself when looking back on what I have achieved inside the garden.

Participants expressed they prefer to allow the garden do its own thing, letting plants grow by themselves to see what unfolds. They are curious to discover what will happen and want to be surprised by what nature can offer them without them personally interfering. However, participants also claimed that they want to feel accomplished by the actions they perform inside the garden. They want to see the success of their own accomplishments within the garden. If participants would let everything grow by themselves inside the garden, they would not have this same feeling of accomplishment as their interference would be low and therefore the contribution to the achievement would be less.

["I let everything in the garden happen a bit"; "[...] just letting it happen is the most important thing"; "I feel proud when I manage to make everything beautiful again. It's a different feeling in the garden than at home"; "When plants have grown big and bear fruit. It shows that you did something right";" Pleasure to see what has been done"]

5. I want to have more space to garden so I can garden more, but I also want to have a balance between gardening too much and just enough.

Some participants expressed their need for more space inside the garden so they could quantitatively garden more. At their current state there is nothing more they could do, due to the space being filled out with plants already and therefore they felt limited. However, gardeners acknowledge that having more space means there is more space which needs to be taken care of for the gardener, causing more work. Participants expressed their desire for a balance between an gardening too much and gardening just enough. To some participants gardening would become boring after a certain amount of time or respectively become too much. Their goal is to be able to relax inside the garden as well.

["I want 50/50 between relaxation and work, but I can [...] spend days on pruning"; "Sometimes [I feel] boredom, I think 'it's been long enough for now'"; "I would like more space inside my garden, right now there is not more that can be done"]

6. I want to take time to experience and enjoy the natural processes inside the garden, but I also want to be time efficient so I can do other activities (inside the garden).

A need for being able to experience nature inside their garden was expressed by the participants during the interviews. Occasionally, they take their time to look at plants and what is generally happening inside the garden. Contrary to this, participants also expressed their need for being time efficient with tasks they want to perform in the garden in the limited time available for them so they can do other activities as well. Therefore they seek a balance between being able to experience nature in its fullest, as well as being able to perform all necessary tasks inside the garden.

["Sometimes I'm looking hypnotized at plants"; "I look at the interaction of plants with other plants"; "It's an amazement to see what is happening in the garden"; "Sometimes gardening is overwhelming. There is so much weeding to be done, but it has to be done"]

7. I want to try new things & experiment inside my garden, but I also want to be successful in gardening.

Participants expressed an interest in using their gardening space to try out new things or just experiment with whatever they have available. However, experimenting does involve the risk that sometimes the results might not be fruitful. This concern clashes with the goal of gardeners wanting to be successful, since they claim to get sad when they notice that their efforts result in negative outcomes, highlighting the emotional investment put into the gardening activities.

["You do homework on something you want, but it's also a lot of trying"; "We tried an attempt at self-sufficiency: we thought we just try it out and see what does well"; "Gardening is more like an experiment to me, you just see what works and what doesn't. You gain experience this way"; "I feel sadness if something goes wrong"; "I have the desire for everything to grow and work well"]

8. I want to be able to experience a fresh place outside of my usual home environment, but I also want to expand my gardening experience outside of the location of the community garden.

The garden at a community garden is valuable through its inherent trait of being a place that let's you escape the everyday environment, according to participants. This is an unique trait they afford to the garden environment. However, participants also wished that their garden was located closer to home, mostly for practical reasons such as having the opportunity of running water and electricity or reduced travel time and distance. Gardeners might not consider that bringing the garden closer to home might diminish the feeling of it being a special place, different from the home environment.

["There is no money for a garden closer to home"; "I only wish this was attached to the house. We lack electricity and running water. [...] We would really like a wood-fired outdoor pool, but you also must have wishes and dreams"; "In the garden I get a holiday feeling. You step away from your daily environment"]

9. I want to receive help from fellow gardeners, but I also want to keep a positive self-image with my garden.

One dilemma that participants experienced the need to receive help from fellow gardeners for tasks they physically cannot perform by themselves. They are prevented from taking desired actions because they are physically unable to individually perform these actions. Although the community garden setting offers the possibility of receiving help from other gardeners in close proximity, participants feel refrained from asking for help as they do not want to seem incompetent through begging for help or asking people, what they perceive to be, silly questions.

["The app group is better than going around begging people for help [...]"; "I don't want to show up with a silly question"; "I decide things at home, [...], but I often want to do things that require help"]

10. I want to feel admired because people like what I am doing, but I also want to be humble about my gardening achievements.

While participants desire showing others their achievements inside their garden to feel proud through affirmation of others, they also want to stay humble, downplaying their achievements by attributing them to often being self-evident. They did want people to like their garden, but they liked to refrain from actively seeking out approval for their achievements.

["I'm not very proud. Everything is a bit self-evident"; "[I don't feel] necessarily proud. If people like it, maybe a little bit"; "Your ego grows from this when others admire it"; "My brother knows all about grapes. I am proud to show him what's coming and how well the grapes have been taken care of"]

12.9 APPENDIX J – Idea generation – Step 1

Ideas generated during grid ideation:

② I want to have imperfections in my garden to be able to enjoy it

VS

③ I want my garden to be flawless to be able to enjoy it

What is definition of "flawless"?
Aren't these different kinds of people?
INDIV.

I want to let the garden grow by itself and be surprised by what it has to offer

VS

⑤ I want to be satisfied with myself when looking back on what I have achieved inside the garden (SUCCESS)
└ feeling proud
REFLECTION

I want to have more space to garden

VS

I want to have a balance between gardening too much and ~~too~~ just enough

(More space means more work)

ACTIVITY

② I want to receive help from my fellow gardeners

VS

③ I want to keep a positive self-image with my garden
→ don't want to seem desperate for help

④ there are people eager to help ←
INDIV/COMM

⑤ I want to feel admired because people like what I am doing

VS

I want to be humble about gardening

③

INDV./COMM.

Show usefulness of weeds (making messy flawless)

A tool that determines how much needs to be pruned to create balance

Wildflowers?
surprise seeds!

A tool that detects what plant it is and it's purpose
this is ....

Go into height on a small scale

Timer

Something anonymous that will still help

App Group (not annoying 1 person)

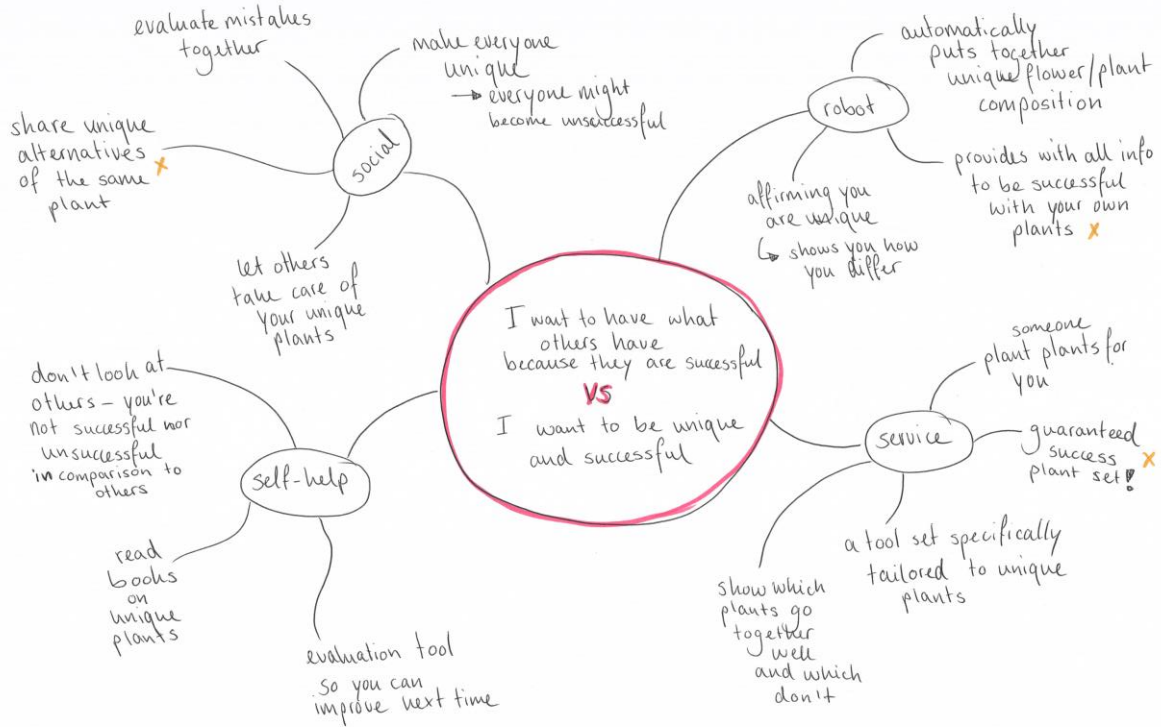only people who pass it will notice
→ board in garden

ask for help

speaker

Anonymous photo sharing where people can have positive comments

→ colour set of tool showing you belong to a mindset, people start talking
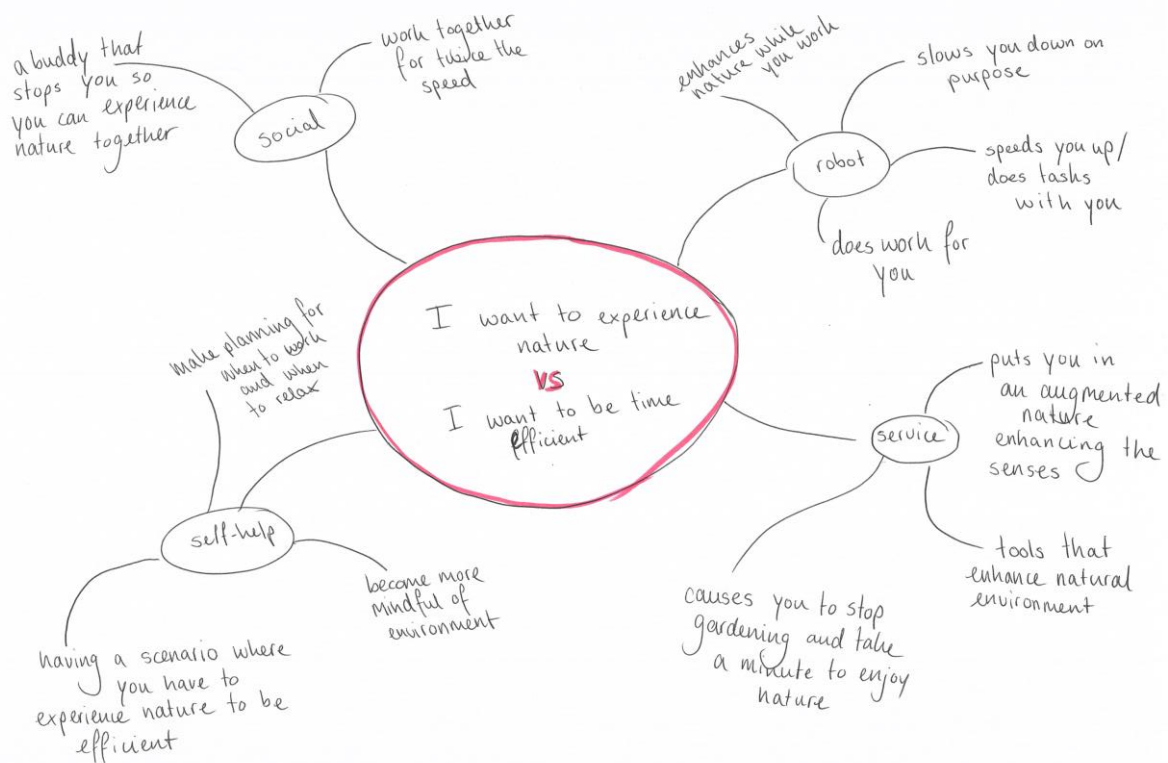→ show shared interest

All-in-one tool that let's you shape the perfect garden!
spit lamp

Poster with very geometric shapes of a "perfect" garden

12.9 APPENDIX K – Idea generation – Step 3 & 4

Ideas generated during brainstorming:

Map 1

Center: I want to have what others have because they are successful VS I want to be unique and successful

social:
- evaluate mistakes together
- make everyone unique → everyone might become unsuccessful
- share unique alternatives of the same plant ✗
- let others take care of your unique plants

robot:
- automatically puts together unique flower/plant composition
- provides with all info to be successful with your own plants ✗
- affirming you are unique ↳ shows you how you differ

service:
- someone plant plants for you
- guaranteed success plant set ✗
- a tool set specifically tailored to unique plants
- Show which plants go together well and which don't

self-help:
- don't look at others – you're not successful nor unsuccessful in comparison to others
- read books on unique plants
- evaluation tool so you can improve next time

(1)

Map 2

Center: I want to experience nature VS I want to be time efficient

social:
- a buddy that stops you so you can experience nature together
- work together for twice the speed

robot:
- enhances while nature you work
- slows you down on purpose
- speeds you up/ does tasks with you
- does work for you

service:
- puts you in an augmented nature enhancing the senses
- tools that enhance natural environment
- causes you to stop gardening and take a minute to enjoy nature

self-help:
- make planning for when to work and when to relax
- become more mindful of environment
- having a scenario where you have to experience nature to be efficient

(2)

141

Mind Map 3

(anonymous) compliment board

social

appreciation / show-off events

go to others to show appreciation

self-help

moments of self-appreciation

forces you to show off

robot

gives you compliments about your garden

encourages you to show others they are doing well to possibly get feedback in return

I want to feel admired VS I want to be humble

service

automatic garden rating system
→ who has the best garden?

Mind Map 4

collaborative activities

anonymous inquiries

gathers info on who can help

helping robot does the task for you

create a list of what needs to be done

"mash" asking for help
- social !

come to garden when I'm not present!

Robot

looks for help for you

strength enhancer

send signal anonymously to multiple gardners ✗

I want to receive help with physical tasks Vs. I don't want to seem helpless

long term services

connecting apps/services

get in touch with people that want to help ✗

professional help services

long term self help

make adjustments so help isn't needed
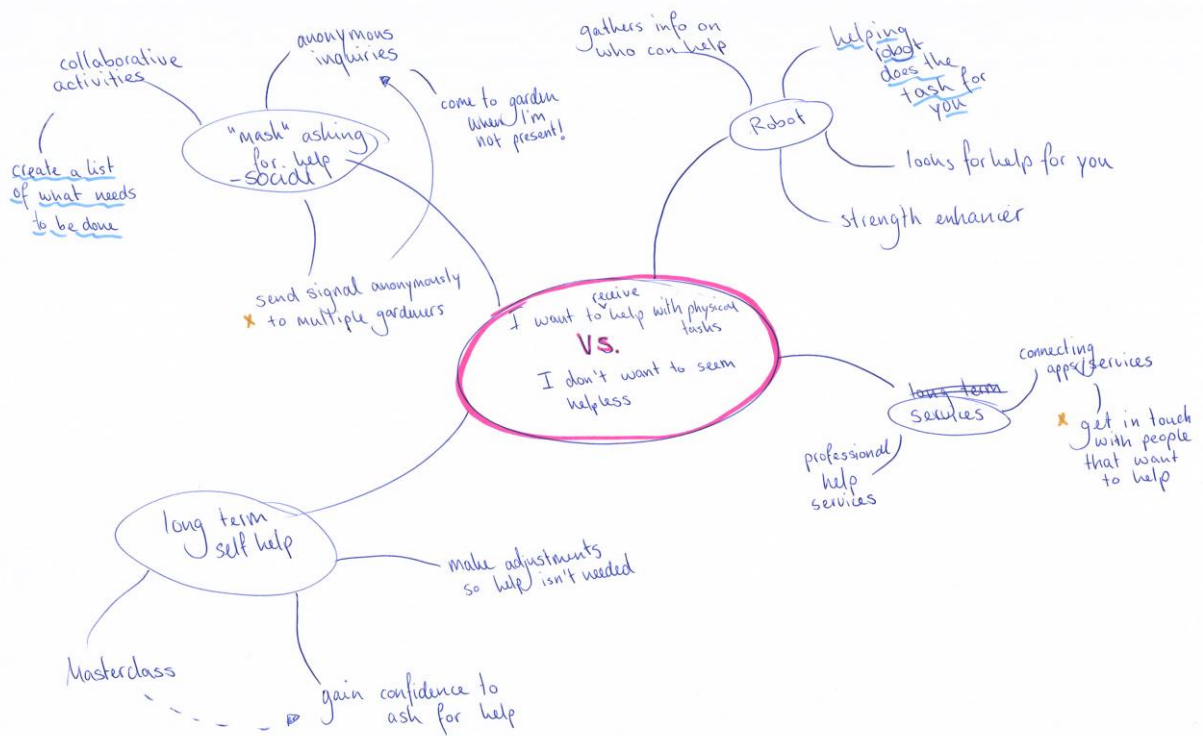
Masterclass

gain confidence to ask for help

Ideas generated during nature analogies:

being part of a group but having your unique traits → showing off nonetheless

1 group, similar goals, resources differ, result is the same

I want to have what others have because they are successful
VS
I want to be unique and successful

①

impossible to be fast

unless carried away

being slowed down on purpose

using nature

taking a moment to revitalize together

also important part of gardening

being time efficient = enjoying the moment

waiting, observing for the right moment

has to experience nature to be efficient

see being efficient as experiencing nature

not always be efficient

I want to experience nature
VS
I want to be time efficient

②

peacock showing off

inherent in it's nature

making being admired normal

having the ability / space to stand out

space is needed to grow

being dominant over others with my growth

showing that you are part of the total picture

realizing that without you the total image is incomplete

Grrr! Grrr!

attracting awareness to yourself

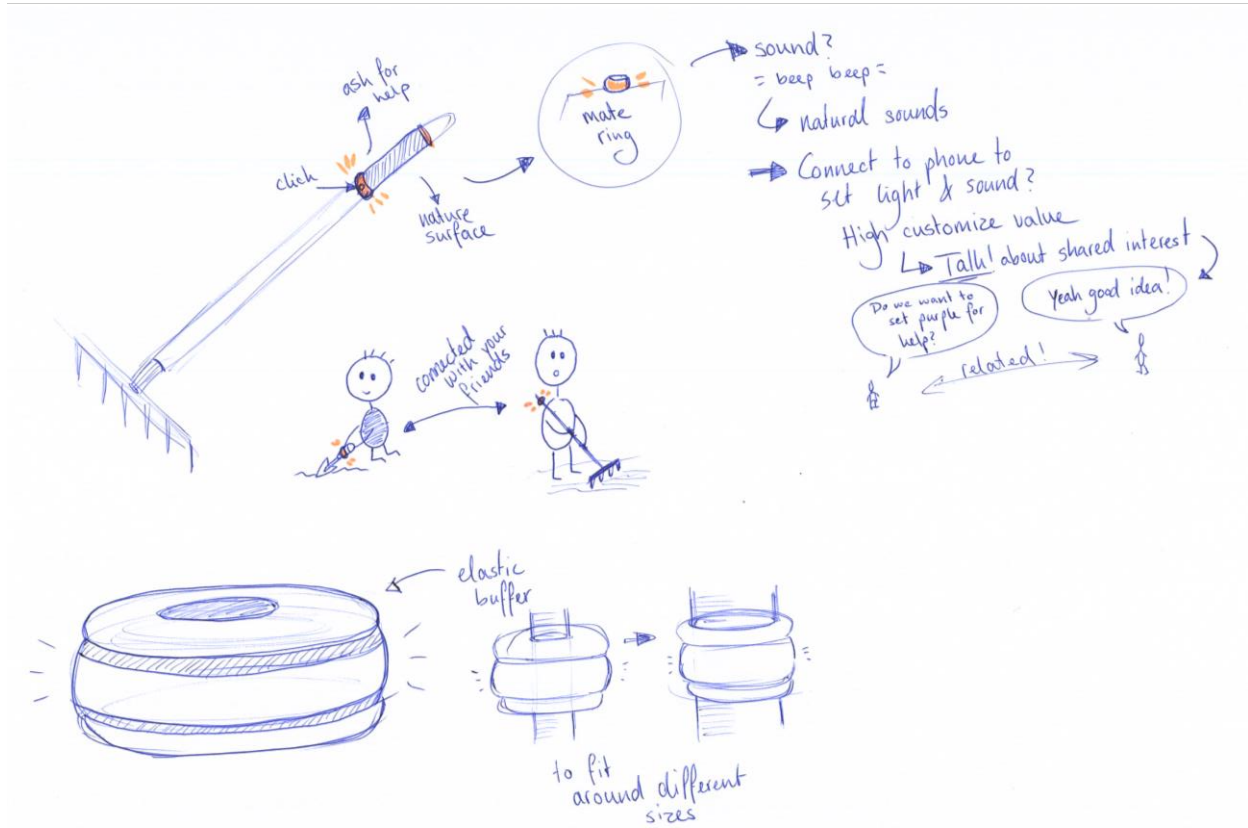this is normal!

I want to feel admired
VS
I want to be humble

③

143

12.10 APPENDIX L – Iteration

Defining the concept
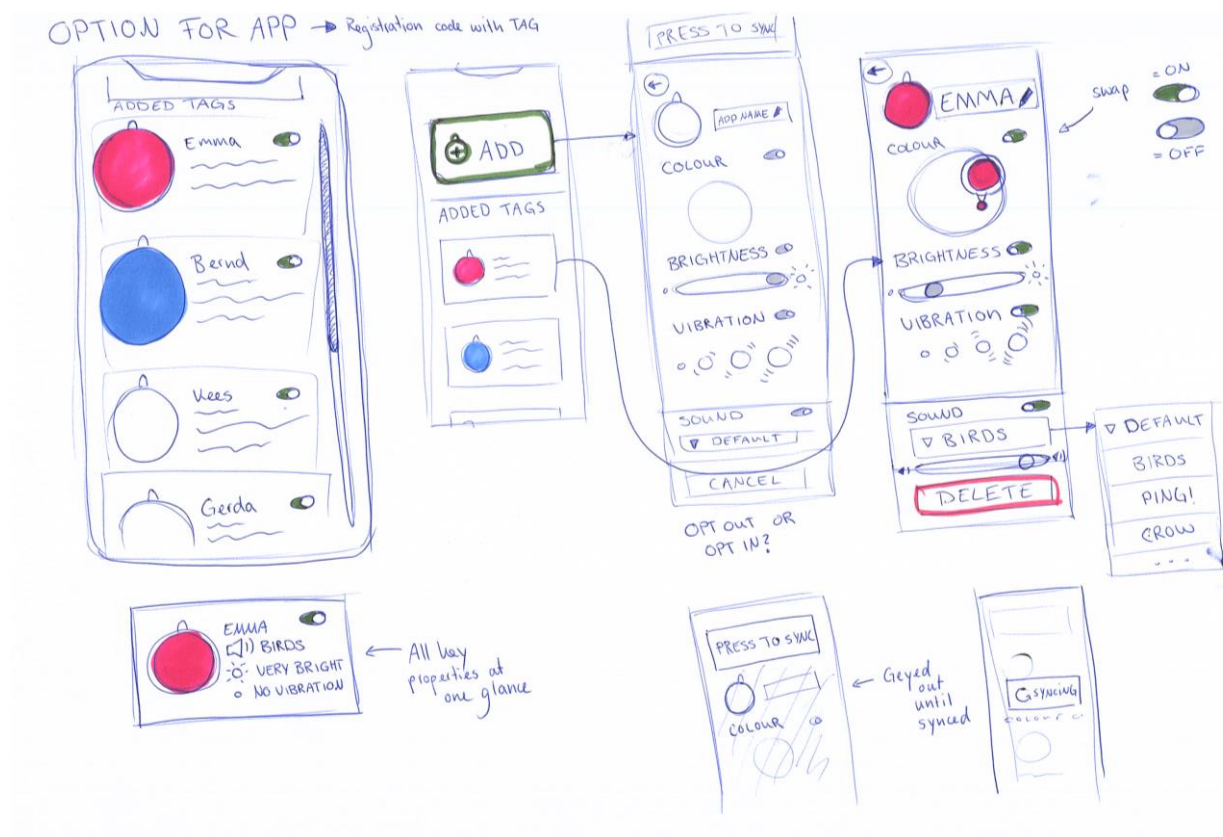
Iteration

Device on tools

The initial idea was to create a device within a tool. However, as different tools are being used during gardening activities, the idea expanded to a device which is attachable to different tools. This way the user can vary the tool, while still having the device close by.
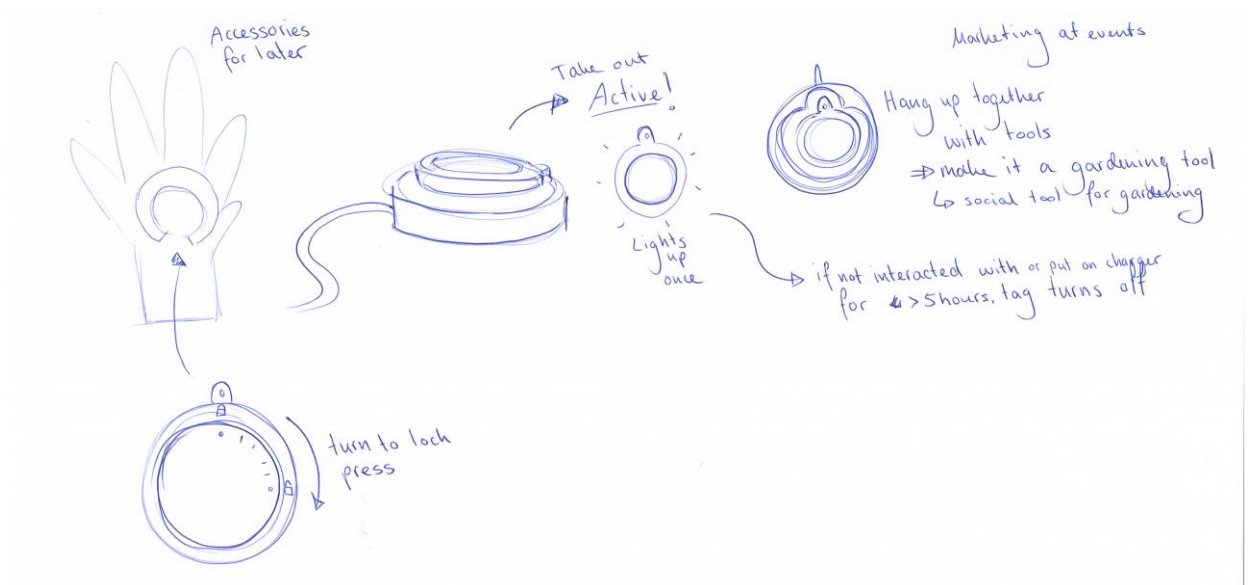
However, since gardeners might forget to change the device or experience it as bothersome to have to change the device from tool to tool while they are gardening, as well as when gardeners are changing their tools frequently back and forth during gardening. Also, as gardeners have been observed to lose track of where they have put their tools, the device might get lost in this process as well.

App

For increased individuality, the option of personalization could be made available through an app. This app could grand individuals the freedom to customize for example sound and colour for receiving help indicators from gardeners they are familiar with. Additionally, an option will be added where signals can be controlled, giving individuals the option to filter requests from specific individuals if they are perceived to be bothersome or signalling is used inappropriately for non-essential matters.

In this section the uncommon use cases and extreme use cases for concept development are explained.

Scenarios 2 – Uncommon use cases

Losing/Misplacing the device

The next day, Kees decides to take his PocketHelp with him again while working inside the garden, since he had experienced how nice it is to be able to call for help. He then notices that unfortunately, he must have misplaced the device as it was not inside the loading station.

SOLUTION: Luckily, the device goes into power saving mode when not interacted with for more than 5h, as this is commonly the maximum time people spend inside their gardens. It therefore should still have power left.

Since Kees is aware that he is quite forgetful, he is happy that the PocketHelp comes with a "Find my device" function. With one click on the button of his loading station, Kees device starts making a beeping sound which leads him the way to his device.

Kees hears the beeps of his PocketHelp coming from underneath the ground and shovels it out, happy with finding back his handy device.

Cancelling help request

[…] While being busy inside the garden, Kees accidentally forgets to lock his PocketHelp and pushes on the button while it is set on "HELP".

SOLUTION: When requesting for help, the device makes a beep sound to indicate help has been requested. He hears the beep and quickly takes his device, turns the button on "DECLINE" and presses it again. Since the PocketHelp is programmed to only send a signal after 30 seconds have passed after pressing the button, in case people would like to rethink their request for help, he still has time to cancel the request by simply pressing "DECLINE" on his own device.

When Kees doesn't realize or hear that he has pressed the button on accident, fellow gardeners might show up, which might be awkward for Kees, but due to the friendly and social nature of the community gardeners, it might most likely be brushed off as a funny moment where Kees got the whole garden together just because of his wild hedge trimming adventures.

Cancelling help offering

[…] One day Tessa receives a help request. She thinks she might be able to help so she turns her button to "ACCEPT" an presses it. However, after she looks at the time, she realizes that she still has her own things that she wants to finish inside the garden before leaving, so she changes her mind and wants to decline.

SOLUTION: She turns her device to "DECLINE" instead and presses it again, declining the request for help.

On Kees side, who has requested help, he first receives the blinking signal that someone has answered his help request. However, after some time his device stops blinking and turns back to

staying on consistently. He realizes that someone must have accepted and then figured they might not be able to help after all. Since he is short on time, he turns his device to "DECLINE" and cancels his request for help. Unlucky, maybe another day.

Scenario 3 – Rare use cases

Multiple people requesting help

[…] Kees has requested help with his PocketHelp. However, at the same time, Tessa is also in need of help, so she wants to utilize her PocketHelp to request help.

SOLUTION: Since Kees pressed his PocketHelp first, he will get prioritized, just like people waiting in line at the checkout of a store. Tessa will first have to decline the help request to send out her own request

Device is empty

[…] For quite some time, Kees has forgotten to charge his device. Unfortunately, his device is now empty and he has lost it, similar to his car keys the other day.

SOLUTION: Kees buys himself a new PocketHelp.

No one available/responding to help

[…] Kees requests help, but since it is a bit of a rainy day, no one else is inside the garden on that day.

SOLUTION: His device recognizes that there is no active PocketHelp inside the communitz garden at the moment. After 10 minutes of no responses of active PocketHelps, his PocketHelp automatically turns off.

Device malfunctioning

[…] Kees notices his PocketHelp has not been correctly receiving or sending any help requests in a while.

SOLUTION: While attached to its loading station, Kees presses a reset button to reset the device.

Someone confirming coming to help but not showing up

[…] Kees has requested help and received a confirmation message that someone will arrive. However, the person that confirmed forgot about confirming and does not go and help Kees.

SOLUTION: Kees PocketHelp recognizes that other devices proximity to it is not changing and turns off after 30 minutes.

12.12 APPENDIX N – Iteration symbols

Before deciding on the final symbols for the PocketHelp, iteration was done on potential symbols that could be used to indicate accepting or denying help requests. While universal symbols seemed to be universally understandable, more context bound symbols were considered to be more suitable. Therefore a middle ground for both was attempted to be found during the iteration process.


Since the interaction was both meant to be bound to a social interaction, as well as an interaction within the context of gardening, it was attempted to create symbols that is reflected by both.
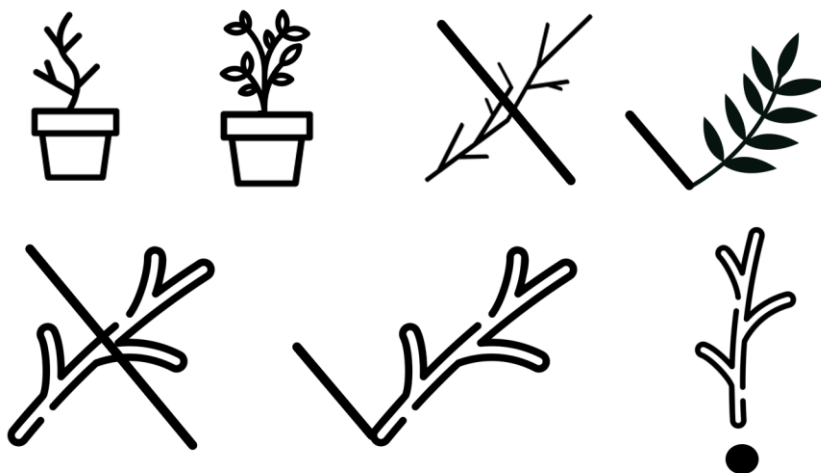

In an attempt to make the natural context icons more understandable, iteration was done on them, combining universal understandable symbols with natural ones. It was also considered to have a more symbolic meaning to some of the icons, for example a blossoming plant for accepting a request and a dry plant for denying.

However, through personal evaluation, these symbols did not seem to be clear enough or reflect the essence of helping another gardener within the context of a community garden. Therefore the choice was made to use a combination of universal understandable symbols, such as an exclamation mark for the need of help and a lock for locking the device when not in use, while for the accepting and denying part hand symbols were used to emphasize the social connectedness that is meant to be within the focus of the PocketHelp.

12.13 APPENDIX O – Additional images prototype

Production process
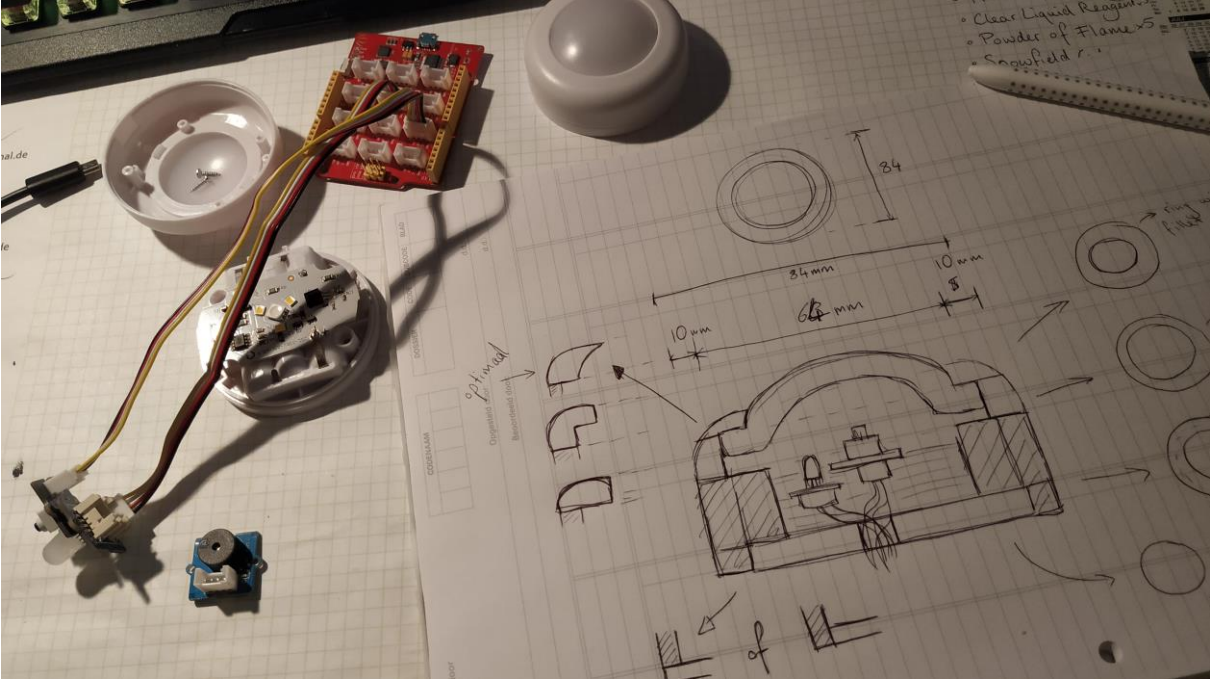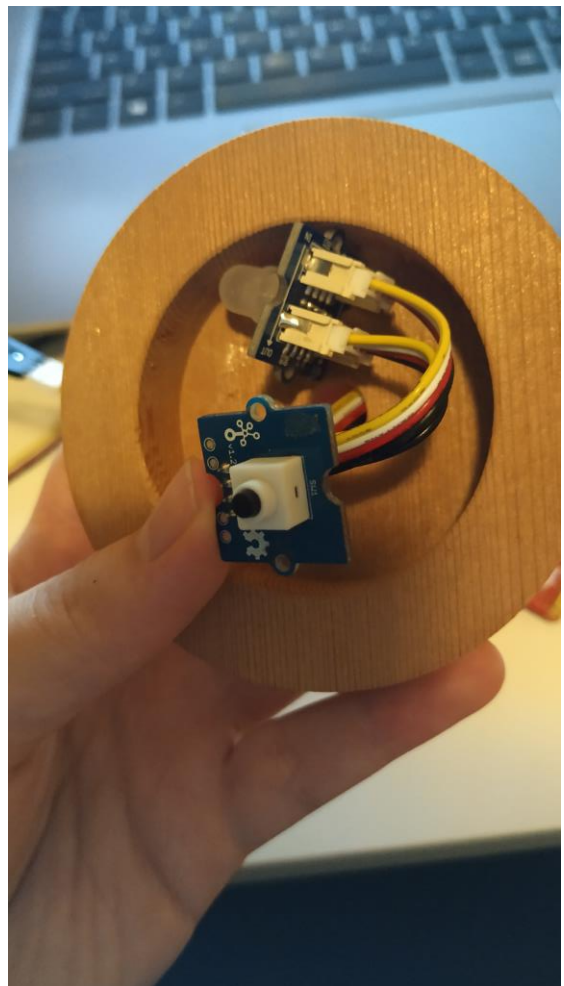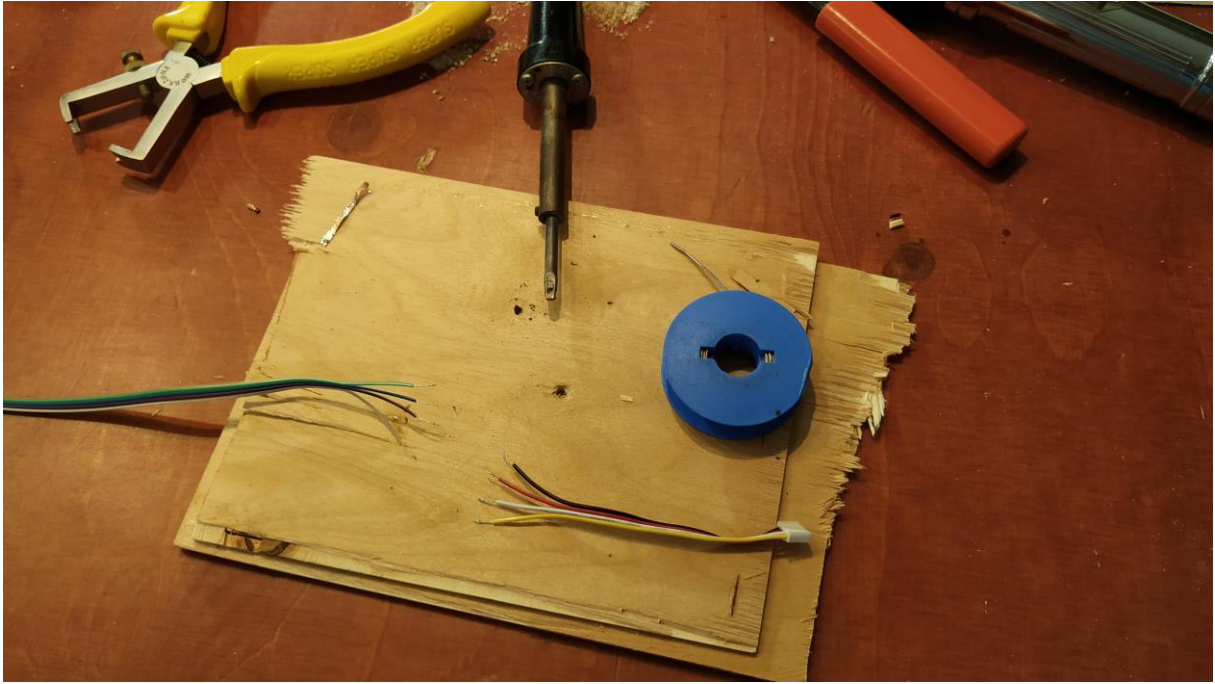
Final prototype

12.14 APPENDIX P – Evaluation interview results

Interview 1: Yellow

Introducing the PocketHelp:

5. Can you describe your understanding of what the PocketHelp is supposed to do based on the information provided?

I see that it's about doing things together. The hand reminds me of the clean-up days. Seems like I can ask for help if I point the leaf somewhere.

It seems like battery needs to go into the back of this.

6. What are your initial emotions, thoughts and impressions as you encounter the PocketHelp for the first time?

It does make me think about radiation and 5G since it seems like it needs to have connection with other devices.

I like that it goes away from using a smartphone to ask for help.

Seems nice for Christmas, you could incorporate it into a Christmas package.

7. How do you feel about the shape, form and properties of the PocketHelp?

It feels nice, made of natural material, I like that

8. Can you describe a scenario where you would have desired assistance but no assistance was available to you?

Normally I am the one providing help mainly, I do not often request assistance. So I am more of a helper than a assistance requester.

Interacting with the PocketHelp:

3. How did the first interaction with the PocketHelp make you feel?

I think it's funny. If everyone has a device like that, that would be really nice.

4. How do you feel about requesting assistance through the PocketHelp?

It's moving away from the smartphone. I just don't know how often it would be used. It seems like an entrance for social input to me, although I am an extrovert myself so I don't really think I need this.

Receiving a positive reaction (the actor comes into play as a fellow gardener providing assistance):

4. How did you feel when the actor, representing a fellow gardener responded positively to your assistance request?
5. What emotions did you experience when the PocketHelp provided feedback through blinking that help would be on the way?
6. Describe any emotions associated with the successful interaction through the PocketHelp with the help of the PrEmo tool.

Awesome! Only positive emotions. Maybe a bit of shame, because you not only have to take but also give. Maybe ultimately also a bit of fear, that in six months' time I will wonder: how does it work again?

4. How did you feel about the lack of assistance?
5. What emotions did you experience when the PocketHelp provided you with the information that none would be coming to assist you?
6. Describe emotions associated with the feedback of absence of assistance and the absence of assistance in general through the PocketHelp with help of the PrEmo tool.

Anger. I do think you have to make it robust so that it doesn't break when you throw it on the ground. And maybe also some sadness that no one can come and help.

Post-testing reflection:

8. How would you describe the overall experience testing the PocketHelp?

I think it's nicely done. There is a balance between technology and no technology. With too much technology it could be negative again, but now you still remain innovative.

I think having vibration and sound for people that are hearing and visually impaired is a necessity. This way you can use it widely.

9. Are there any questions or concerns you have about the concept?

I think maybe people should start looking at statistics to see who asks for help and how often. There must remain a balance.

10. Were there any aspects of the interaction that you found particularly intuitive or challenging?

From observations: The participant held the button instead of clicking it once. They also did not utilize the turning wheel as intended. The meaning of the symbols seemed to be a bit hard to recognize.

11. Did you feel in control over your interactions and requests?
12. How do you feel about the idea of using the PocketHelp in a scenario where you need assistance?

I wonder how necessary it is. I know everyone here and if there are people I will hear it. I am more of a helper than someone who asks for help. Although I could help people who are not close to me with this. I don't think I would use it that often unless other means of communication are not possible.

13. Do you think the PocketHelp could positively impact the emotions associated with seeking assistance within the community garden?

Sure! It makes me happy when I can help other people. And it is a fun treasure hunt. I think it might be more suitable for a nursing home/senior apartment.

14. What aspects of the PocketHelp would you suggest to be improved?

I would take a broad approach and look at other markets. Everyone in the Netherlands could use this, although you would have to adapt it to the context.

Introducing the PocketHelp:

1. Can you describe your understanding of what the PocketHelp is supposed to do based on the information provided?

I think it is for locating people that require help.

The little locking icon is I think to show people I do not want to be disturbed. The shaking hands is for providing help and I think the hand that is held up is for showing I need assistance? I do not know what the exclamation mark is for then.

2. What are your initial emotions, thoughts and impressions as you encounter the PocketHelp for the first time?

It seems useful to me, I often don't use WhatsApp in the garden. It reminds me a bit of a pager in a restaurant. The hand reminds me of a helping hand. And the lock looks like it means you don't want to be disturbed.

3. How do you feel about the shape, form and properties of the PocketHelp?
4. Can you describe a scenario where you would have desired assistance but no assistance was available to you?

My boyfriend and I once tried to put a tent on top of our pergola, but we couldn't do it alone. So, we had to go around the garden to ask people for help. We felt a bit shameful, because it looked like we hadn't planned ahead of time, but we know that people here are actually quite relaxed.

Ultimately, we felt proud that we had accomplished it together. Although it is easier to ask if you know each other.

Interacting with the PocketHelp:

1. How did the first interaction with the PocketHelp make you feel?

I think it looks very easy to use. I just press the button and someone will come to help.

2. How do you feel about requesting assistance through the PocketHelp?

Receiving a positive reaction (the actor comes into play as a fellow gardener providing assistance):

1. How did you feel when the actor, representing a fellow gardener responded positively to your assistance request?
2. What emotions did you experience when the PocketHelp provided feedback through blinking that help would be on the way?
3. Describe any emotions associated with the successful interaction through the PocketHelp with the help of the PrEmo tool.

Surprised and happy that it works. Someone comes to help you that you might not meet otherwise. You might be able to expand your network with it. I feel hopeful when someone comes along - I hope that person can also help me with my problem.

Receiving a negative reaction (no one will come to provide assistance):

1. How did you feel about the lack of assistance?
2. What emotions did you experience when the PocketHelp provided you with the information that none would be coming to assist you?

3. Describe emotions associated with the feedback of absence of assistance and the absence of assistance in general through the PocketHelp with help of the PrEmo tool.

I am disappointed that no one is coming. I had hoped that someone would come. But I understand that when no people are present or do not have time themselves they would not respond and I don't really mind that.

Post-testing reflection:
1. How would you describe the overall experience testing the PocketHelp?
2. Are there any questions or concerns you have about the concept?

What if it 100 people get a signal? Then they will all be standing in your garden soon haha.

Charging seems easy to me for people who have solar panels.

And what about people who just want to talk? It does prevent prejudices - what if you offer help to people you don't want?

3. Were there any aspects of the interaction that you found particularly intuitive or challenging?

Pressing the button seemed clear to me.

From observations: Turning the wheel did not seem immediately intuitive.

4. Did you feel in control over your interactions and requests?
5. How do you feel about the idea of using the PocketHelp in a scenario where you need assistance?
6. Do you think the PocketHelp could positively impact the emotions associated with seeking assistance within the community garden?

Yes, I think it's a good idea to make interactions with people. WhatsApp is more something I read at home and not in the garden. I often want to offer help to people when they are just standing at the gate.

7. What aspects of the PocketHelp would you suggest to be improved?

Maybe if you're not available, a stop sign. The hand looks more like a "Hi, I'm here!".

Our dog has a tracker with GPS that is quite accurate. It is with a subscription, so maybe you can still take a look at that?

Maybe you can talk to each other through it too. But then you know who is coming to help you.

Introducing the PocketHelp:

1. Can you describe your understanding of what the PocketHelp is supposed to do based on the information provided?

If you press it, someone will help you. Locking is also clear. But what is actually the symbol for distress? The exclamation mark is also clear again. Also the handshaking. Waving hand – like "I can't", yes, that's clear. I would use some other symbols to make it even clearer.

2. What are your initial emotions, thoughts and impressions as you encounter the PocketHelp for the first time?

Normally I can see someone coming in advance if they need help. And if that person just asks me, that's completely okay too. If it involves just pressing a button, then I think yes, someone else will solve it. It's so anonymous with a button, then I think yes, let me finish my own work first before I help someone.

3. How do you feel about the shape, form and properties of the PocketHelp?

It does feel like a nice material. It is also light and does not bother you when you wear it. Love that it is made of wood. I think it's nice to see.

4. Can you describe a scenario where you would have desired assistance but no assistance was available to you?

I haven't been here very long. Haven't experienced it myself yet, no.

Interacting with the PocketHelp:

1. How did the first interaction with the PocketHelp make you feel?
2. How do you feel about requesting assistance through the PocketHelp?

Receiving a positive reaction (the actor comes into play as a fellow gardener providing assistance):

1. How did you feel when the actor, representing a fellow gardener responded positively to your assistance request?
2. What emotions did you experience when the PocketHelp provided feedback through blinking that help would be on the way?
3. Describe any emotions associated with the successful interaction through the PocketHelp with the help of the PrEmo tool.

I felt happy. It doesn't matter much to me that it's strangers who come to help.

Receiving a negative reaction (no one will come to provide assistance):

1. How did you feel about the lack of assistance?
2. What emotions did you experience when the PocketHelp provided you with the information that none would be coming to assist you?
3. Describe emotions associated with the feedback of absence of assistance and the absence of assistance in general through the PocketHelp with help of the PrEmo tool.

It's annoying when no one comes. Although it also depends on what I'm doing. Maybe a little angry and disappointed if no one comes: "Hello, why is no one coming?"

Also lonely. You ask something and have the feeling that no one wants to help you. If I press, I would expect someone to come. But I also expect that if someone needs help, I will come and help. That's not always a good feeling – I mainly want to be able to do my own thing.

1. How would you describe the overall experience testing the PocketHelp?
2. Are there any questions or concerns you have about the concept?
3. Were there any aspects of the interaction that you found particularly intuitive or challenging?
4. Did you feel in control over your interactions and requests?
5. How do you feel about the idea of using the PocketHelp in a scenario where you need assistance?

Should I give everyone coffee? Everyone is always very helpful here, but perhaps this is indeed less intense than walking up to people. You never actually walk into a garden even if help is asked. There is an unwritten privacy rule.

6. Do you think the PocketHelp could positively impact the emotions associated with seeking assistance within the community garden?

If I want more with the people around me, I would approach them. Don't really need it at the moment. But maybe in 3 years things will be completely different. That you need it more.

I'm very much on my own estate. I'm not really concerned with social interactions around me, if I want to I'll ask my own friends. The people I know actually just want to be more private.

7. What aspects of the PocketHelp would you suggest to be improved?

Maybe a "zzz" symbol to show that you don't want to come. Or a man calling out that shows that you need help. Can't it just be with hearts too? Or a red cross: I can't and a green bracket: I can.

Maybe an extra function "chatter chatter": If you just want a cup of coffee with someone, take a break together.

Introducing the PocketHelp:

1. Can you describe your understanding of what the PocketHelp is supposed to do based on the information provided?

Oh yes, it is to ask for help. And to give. You want a helping hand, so you place the device on the hand.

2. What are your initial emotions, thoughts and impressions as you encounter the PocketHelp for the first time?

Oh this seems exciting and mysterious. It seems very impressive, but I'm actually becoming more and more curious about what it is.

It only works if other people have it too. Is it personal? Otherwise I could also pass it on to my neighbor. Then she can also ask for help when I am not there.

It reminds me of a buzzer in a restaurant.

3. How do you feel about the shape, form and properties of the PocketHelp?

It reminds me a bit of responsible children's toys because of the color and the combination of plastic & wood. Although I do find it sympathetic material. It does feel nice.

Find it a bit difficult to judge. This size does have its charm. Bit of a thermometer shape, like an old-fashioned thermometer, or old-fashioned clock. The wood feels very natural.

I think it's a nice shape.

4. Can you describe a scenario where you would have desired assistance but no assistance was available to you?

Not that I can think of right now, no. Often I know the situation or I simply plan in advance what is going to be done and then I seek help in advance. Of course, I could easily ask someone if I need help. Or solve it yourself or come up with tricks. For example, walk several times for cleaning up leaves. Although I may find it difficult to ask. So maybe it's a funny device after all.

Interacting with the PocketHelp:

1. How did the first interaction with the PocketHelp make you feel?

I often think that people are too busy with their own things to really bother anyone.

2. How do you feel about requesting assistance through the PocketHelp?

It reminds me of a primitive alarm. Maybe it's more something for the neighbors?

Talks about positively: Oh yes, you put a kind of sieve within the garden – people who don't want to solve problems are kept out. So you can filter who you ask and you won't bother people outside the garden.

People often come together during working days, and you also notice that people come together who enjoy doing that. Many garden enthusiasts have a do-it-yourself approach. It's an additional way to connect. A bit of a targeted network.

Receiving a positive reaction (the actor comes into play as a fellow gardener providing assistance):

1. How did you feel when the actor, representing a fellow gardener responded positively to your assistance request?

2. What emotions did you experience when the PocketHelp provided feedback through blinking that help would be on the way?
3. Describe any emotions associated with the successful interaction through the PocketHelp with the help of the PrEmo tool.

I find it exciting. You don't know who it is that is coming to help. But also shame – is it really that important? Life goes on even if I don't get help. Also admiration and fascination: oh how funny.

I'm also hopeful, I don't know if it will work despite the help. And joy: Someone is coming to help me!

Yet the feeling of shame remains.

Receiving a negative reaction (no one will come to provide assistance):
1. How did you feel about the lack of assistance?
2. What emotions did you experience when the PocketHelp provided you with the information that none would be coming to assist you?
3. Describe emotions associated with the feedback of absence of assistance and the absence of assistance in general through the PocketHelp with help of the PrEmo tool.

Participant acts very understanding: Well that's just how it is. Maybe a little sadness: I already have such a device and then no one will come!

Post-testing reflection:
1. How would you describe the overall experience testing the PocketHelp?
2. Are there any questions or concerns you have about the concept?

Don't people plan questions? Maybe abuse it. Cheeky people can simply ask for help with simple tasks. So what if people are just lazy?

What if someone comes and says no to the job that should be done?

I think the system could become infected very quickly. Or you don't take action because you already know who has a device and you don't want to help them.

Anonymous can be fun, but it could quickly become infected with people taking advantage of the good nature of others.

3. Were there any aspects of the interaction that you found particularly intuitive or challenging?

The lock was not completely clear.

4. Did you feel in control over your interactions and requests?
5. How do you feel about the idea of using the PocketHelp in a scenario where you need assistance?

It's a bit of a reverse order. Normally you first make the social connection and then you ask for help. Now it's the other way around.

6. Do you think the PocketHelp could positively impact the emotions associated with seeking assistance within the community garden?

I think there's something to it. Some people would be more likely to ask for help like this.

7. What aspects of the PocketHelp would you suggest to be improved?

12.15 APPENDIX Q – Evaluation results – Interaction, shape and form, recognition design intentions, connotations & suggestions for improvement

Interaction

During the testing, the understanding of the PocketHelp as well as the required interactions to request help was evaluated.

For every participant it was clear that through pressing a button, they would send a signal to another gardener, making them aware of their need for assistance.

However, it was noted that the turning wheel was very little interacted with 3 out of the 4 participants did not turn the wheel before pressing it to request help.

While the accepting help symbol was recognized by every participant, the symbol to request help was confused with the rejecting a help request by 2 participants. From observations it seemed that there was slight confusion about using the same device to request as well as respond to help requests.

Shape & form

Every participant agreed that the material of the PocketHelp felt nice, because it was made of natural materials. They approved of the qualities of it being light and small, as to not bother during gardening activities and found the device to be visually pleasing. One participant expressed to be especially fond of the fact that the PocketHelp felt technologically balanced, as it had some technological components, but was not too technologically overwhelming for the fit in its context.

Intentions

During the interviews, by some of the participants, the treasure hunt idea got recognized. They mentioned that the helping hand symbol is very clear and that it enhances the intention of the design, namely it being about helping others.

During the interviews it was also confirmed by the participants that they dislike using their phones inside the garden. They saw the correlation that the PocketHelp is an alternative for a phone, which is able to reach multiple people within the garden, while being busy inside the garden.

Some participants mentioned, that even though it might not be helpful now, they might reconsider this statement in the future, when individual conditions change. Maybe later they would like to have such a device to request help when they have started thinking more about it.

There was also a change in attitude towards the device by different participants. When the intention of only reaching people who are willing to help with help requests became clear, they were more willing to use the device. They realized that this way they would not be disturbing anyone, as they only contact gardeners that explicitly show that they are willing in wanting to help.

One participant pointed out that the PocketHelp works in a reversed order. Normally you go from social interaction to helping each other, as people tend to first create social relationships before asking someone for help. With the design, this order is reversed, as you would first request help and then establish a social relationship.

Frequent connotations

During the interviews, the participants made frequent connotations with other products and devices they recognized within the PocketHelp.

These products and devices are:

- Restaurant buzzer
- Emergency button nursing home
- Primitive alarm
- Old thermostat
- Pocket watch

Most of these connotations had already been made previously, and while pocket watch is a desired connotation, emphasized by the name "PocketHelp", emergency buttons for a nursing home are less desired, as they can be deterrent.

Suggestions for improvement

Towards the end of the interviews, participants made suggestions for different features of the PocketHelp. Some participants for example suggested to also use the device outside of the garden, maybe inside the home, or use it in private gardens, together with your neighbours.

Considering that it is not clear if any tools are needed for a specific help request, participants suggested including a way to talk with each other, or at least make clear to each other what is needed. There were also several suggestions made towards the symbols, for example using a stop sign to indicate no help is needed, or change the meaning of certain symbols, such as the hand could mean "Hi, I'm present". It was also suggested to use a simple checkmark as symbol to accept request and a cross to decline, as these are universally recognized symbols.

One participant suggested to include a talking function, so necessities could be communicated, such as needing extra tools to get a certain task done. It was also suggested to include a social function to the PocketHelp in order to prevent the misalignment of expectations from people that require "social" assistance.