# DESIGN RESEARCH PROPOSAL

Semester 1, 2025

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(RDNE Stock Project, 2020)

# Introduction

Historically, Aotearoa New Zealand has been facing increasing rates of loneliness and social isolation among older adults. Certainly, these issues have been framed as psychological or emotional concerns, which has shifted the conversation away from the underlying systemic gaps in how wider society engages with our ageing population.

Traditionally, older adults - individuals aged 65 years and above - experience significant life transitions from working to retirement, physical and cognitive decline, loss of partners and friends which exacerbate feelings of social isolation and weakened sense of purpose.

This research seeks to propose a design solution in order to reduce loneliness in older adults through meaningful and dynamic interactions with nature and the wider environment in order to alleviate feelings of social isolation and alienation. Additionally, this research specifically suggests a digital intervention that leverages a gamified social gardening experience that blends digital and physical components.

As a result, this study seeks to argue that through these interventions, older adults can enter a system designed to foster psychological resilience, purpose and connection during later life.

This research is also informed by my own positionality and by extension, my personal lived experience. My relationship with gardening is rooted in my family spanning back generations - firstly with my mother who gardens as a leisurely hobby, to my grandmother, who lives alone, and seeks gardening as a method in bringing structure and routine to her life.

Despite being close to a wider local community and family, my grandmother finds fulfilment and purpose in nurturing the plants around her. Growing up and observing this day-to-day practice has inspired me to consider how gardening may be effectively designed in order to support other older adults in similar circumstances.

(Jim Wellington, 2016)



# Introduction

This project will be informed and will work alongside Oceania Healthcare, one of New Zealand's top aged-care providers. Residents of Oceania retirement communities seek novel methods of social engagement, to which Oceania seeks to execute in sustainable ways, specifically through the Green Star Communities Framework, Version 1.

In particular, the project seeks to support Credit 6: Sustainability Awareness by firstly promoting activities rooted in nature that fosters ecological mindfulness without requiring major education or knowledge curves. Through this project, gardening enables residents to interact with the environment, build stewardship with the wider local region and nature whilst adopting practices that support long term sustainable outcomes. These outcomes can extend to personal, local, communal and even national benefits.

Furthermore, the project upholds Credit 12: Culture & Identity by promoting individual user agency, purpose and cultural awareness. Moreover, by incorporating residents within the co-design aspects of gardening, it further elucidates the need for Maori ecological knowledge, intergenerational practices further accentuating the role this research plays in creating a sense of belonging, further reducing feelings of social isolation. This design vision of this project is unique in its emphasis of purposeful life, positive aging and emotional nourishment when leveraging gardening.

Certainly, my research approaches gardening as not just a hobby, but as a powerful tool to elder well-being and communal engagement. When looking at other solutions, they may focus solely on technology, with many failing to integrate care, sustainability and culture into a deep, holistic design experience.

Ultimately, this project seeks to contribute to an important conversation surrounding Aotearoa New Zealand's increasing elderly population through designing for well-being, dignity and healing.

**Aaditha Demeth Meeriyagalla**
Capstone Lead

# Problem Definition

In Aotearoa New Zealand, elders face a growing issue of social isolation, where feelings of loneliness and alienation are most prevalent. The shift from being with family, a trusted and known community, towards communities such as retirement homes where elders require reintegration have further exacerbated feelings of social isolation. According to Age Concern Auckland (2024), 59% of elders felt lonely and/or socially isolated. Moreover, given Aotearoa's growing elderly population estimated to reach 1 million in 2028 (Stats NZ, 2022), this research is fundamental in finding solutions towards an increasing issue for current and future elders in New Zealand.

Going further, it is important to identify and address the wide variety of factors that contribute towards social isolation in elders within Aotearoa New Zealand. External factors such as globalisation and internal factors like grief, confidence, purpose and a lack of retirement planning all contribute towards increased social isolation among elders (Age Concern Auckland, 2024). Firstly, the role of globalisation and dispersed families due to emigration from New Zealand resulting in over 1 million New Zealand citizens living overseas as of 2020 has created geographical isolation and subsequently increased feelings of social isolation for elders from these families.

Secondly, grief and loss among elders is a huge factor contributing to social isolation, with 68% of elders reported worse health two months after their spouse had passed, resulting in a loss of shared identity, survivors guilt, emotional loneliness and social isolation (Age Concern Auckland, 2024).

By analysing Aotearoa through a post-colonial lens of the British empire, it is important to also analyse the broader context and approaches of the different attitudes towards taking care of elders. According to (Martinez-Carter, 2015), the attitudes of western cultures being youth-centric, individualism-focused and independent often clash with the needs of the elderly. As a result, within western countries, the elderly are often submitted to the care of retirement communities, nursing facilities and living homes. It is in these communities where the elderly often feel even greater feelings of social isolation as they are tasked in assimilating in a new environment without the care of their loved ones. Recent studies have shown that 38.7% of elders in retirement villages felt lonely sometimes, often and always (Boyd et al., 2020). This lack of social engagement and resulting social isolation has shown to increase the likelihood of heart disease, declining cognitive function and depression (Xia & Li, 2017).

**59%**

**of Elders feel lonely and/or socially isolated**

**38.7%**

**of Elders feel lonely in retirement villages**

**1,000,000**

**over 65 by 2028**

# Problem Definition

Despite some elders wishing to alleviate their feeling of social isolation, there are still barriers present that inhibit their ability to engage socially. Firstly, physical health challenges, such as mobility issues, can hinder participation in community activities, and social interaction (Sunarti et al., 2021). There are also technological barriers in place, such as poor digital literacy, that hamper older adults in engaging in community platforms, social media and reconnecting with family members. However, it is important to note that this issue is slowly dissipating with 2 in 5 elders embracing more technology due to the pandemic (New Zealand Seniors, 2022).

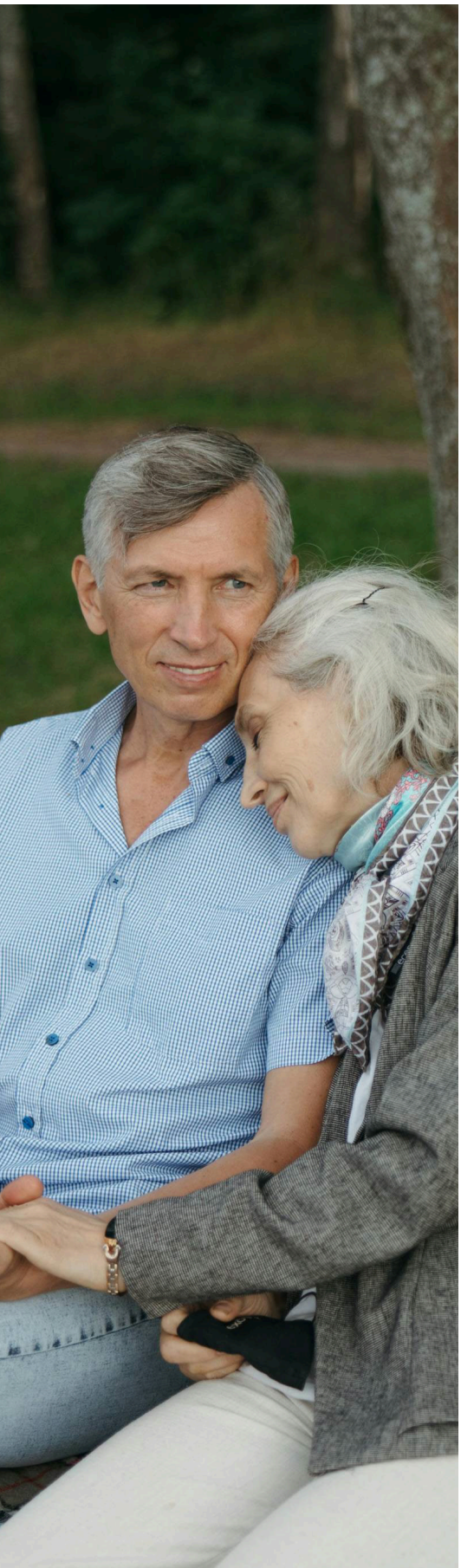
Considering the primary challenges of the proposal, a question to ask is: How might we discover new methods to help alleviate social isolation in older adults by leveraging modern technologies and simultaneously helping elders better connect with their community and the environment? This proposal aims to address the challenge of:

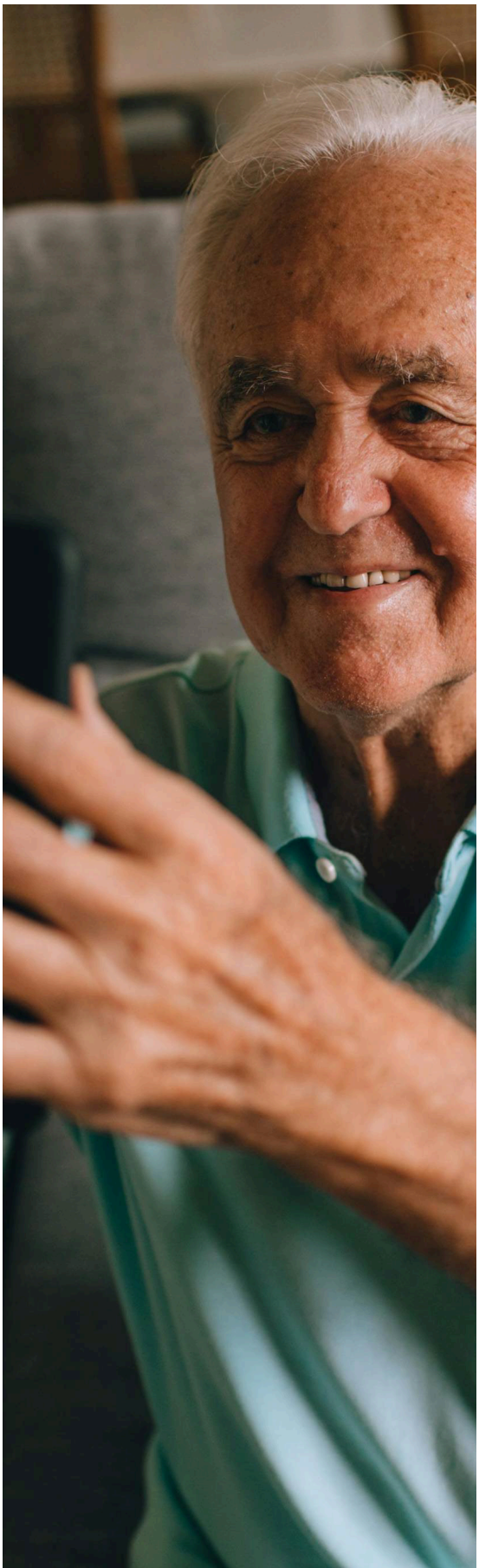


(Kampus Productions. 2021)

**How might we design a mobile application that uses gamified social gardening to reduce feelings of alienation and social isolation and promote positive ageing among elders in Aotearoa?**

# Research Background







# A connection to nature and its impact on psychological resilience

Historically, humans have turned to nature to relieve psychological strain. In a theoretical sense, biophilia - initially coined by Wilson (1984) - suggests that humans have an innate affinity to nature.

Research has shown that a connection to nature and exposure to natural environments where interaction with flora and fauna is present can enhance psychological wellbeing and resilience, especially in older adults. Boffi et al. (2021) provides an interdisciplinary co-design approach to creating natural environments within the urban environments.

Within this study, the importance of Attention Restoration Theory (ART) is emphasized - which is a theory centred around three main pillars: “compatibility”, “fascination” and “being away”. Compatibility, refers to the individual’s ability to integrate with their surroundings. Fascination outlines the need to interact with interesting external stimuli, such as plants, water and wildlife. Finally, “being away” refers to the experience elders may face where they feel away from routine surroundings, providing a space for calm and escape.



(Greta Hoffman, 2021)

# Gardening as a Social, Therapeutic and Wellbeing Practice

Gardening can be defined as the activity of cultivating, working on and maintaining a garden of greenery that may contain plants, flowers and vegetables (Chalmin-Pui et al., 2021). Certainly, for the purpose of alleviating social isolation within elders in Aotearoa, gardening can provide a multitude of benefits for elders facing social isolation.

### Gardening Benefits for the Individual

Gardening can offer a myriad of benefits for older adults. Firstly, older adults who are actively engaging with maintaining their garden require moderate to physical activity that lowers the risk of morbidity and lower mortality rates in older adults with cardiovascular disease (Wannamethee et al., 2000).

Furthermore, gardening provides a purpose through a daily routine, which encourages creativity, cultivating in increased self esteem (Lampinen et al., 2006). Additionally, learning about new plants (names, types and historical significance), planting methods and new gardening processes can aid in mental stimulation for older adults, fostering cognitive enhancement and social engagement (Scott et al., 2014). Moreover, leisure gardening among older adults that leveraged digital interventions have also proven to increase gardening efficiency, foster a sense of community belonging and digital literacy (Vassányi et al., 2023).

### Gardening Benefits for the Community

Within community environments, the positive aspects of leisure gardening are increased when done in a social and communal setting.

Group gardening among elders, especially in a retirement village/community setting, can provide a space to exchange knowledge and grow as a collective, thereby minimising feelings of social isolation and loneliness. According to Park et al. (2016), 95.8% of elderly women in a community center in South Korea reported being very satisfied with the gardening intervention program, showcasing significant improvement such as improved muscle mass, aerobic endurance, hand dexterity, cognitive ability and decreased waist circumference.

Moreover, there are significant benefits for participating in a gardening group that allow for opportunities to connect with the environment and other residents of the village, which are important within a transitional stage of life such as retirement (Scott et al., 2020). These benefits are particularly crucial in tackling the overarching issue of social isolation within elders in retirement communities.



(Gary Barnes, 2021)

# Gamification and Motivation in Digital Health & Wellness Tools

Historically, digital health and wellness tools have been utilized in order to help resolve social isolation and alienation. Gamification, according to Deterding et al. (2011) can be defined as the use of game elements within non-game contexts.

Certainly, within the context of digital health and wellness tools, gamification has been leveraged in order to better engage the user and enhance motivation and behavior. Principles of gamification may include, but not limited to, challenges and streaks, progress bars, leaderboards and rewards (Fard, 2023). With respect to health and wellbeing apps, gamification has shown to be an effective tool with 59% of study participants reporting positive effects, with strong evidence supporting improvement in physical activity (Johnson et al., 2016).

### Gamification benefits for Older Adults

Gamification has shown to be a strong tool to leverage when requiring the engagement of older adults in new and recent technology and initiatives.

Firstly, gamification has shown great success in order to encourage older adults to engage in physical activity. According to Kappen et al. (2018), gamification has shown to boost motivation, enjoyment and engagement in physical activity for elders.

Furthermore, older adults who engaged with gamification reported significantly higher perceived competence, which helped them develop a stronger sense of purpose (Kappen et al., 2018). Finally, gamification has found to improve physical activity through increase step counts when combined with "exergames" - games that encourage physical activity (White et al., 2022).

### A different type of Gamification

However, gamification for a younger audience and an older audience must be effectively distinguished in order to maximise its effect.

For example, a study conducted by Altmeyer et al. (2018) showcased that while younger audiences embrace competition, older adults seek to avoid it. Rather, they seek a care-taking, collaborative and socialising approach against leaderboards, badges and points.

Nevertheless, Minge and Cymek (2020) found that older adults are generally responsive and acceptive of gamification initiatives, where they have a high acceptance of aspects such as visual progress and varied task difficulty. On the other hand, they showcase a low level of acceptance to speed rewards and customisable profiles (Minge & Cymek, 2020).

**Gamification has shown to boost motivation, enjoyment and engagement in physical activity for elders (Kappen et al., 2018)**

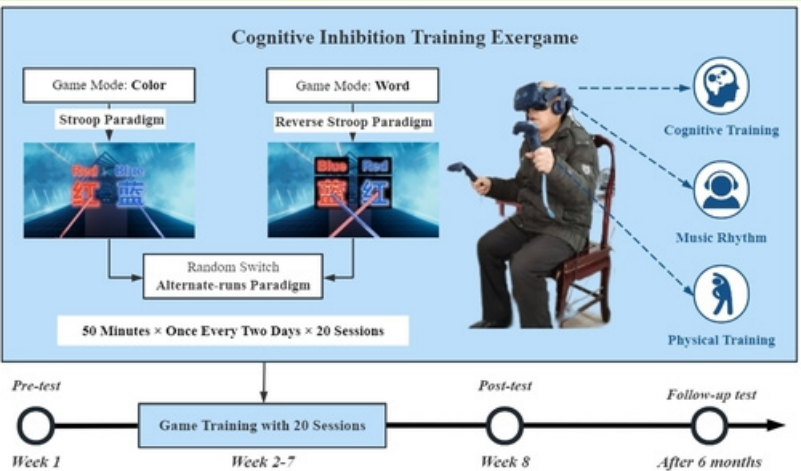
# Case Studies and Broader Context



## The Orono Community Garden

Founded in 2004, located in Maine is a community driven initiative driven by low-income volunteering seniors with the aim of tackling food insecurity and social isolation (University of Maine, 2015). The primary purpose of the garden is to produce cultivation, food donations and community services within the nearby housing complexes. The practical benefits include growing produce during cultivation season, which includes 50 households receiving 3.2kg of fresh vegetables on average. This initiative fosters healthy eating and socialising between volunteers and recipients (Mullis, 2016).






## LightSword

In the realm of VR, LightSword provides an "exergame" modality to assist older adults in improving their cognitive abilities. The game instructs players to physically move based on cognitive problem input, which simultaneously improves their mental and physical abilities at the same time. In this eight month study, participants who were 60 years of age or older showcased gains in their cognitive inhibition 6 months after the study started (Du et al., 2024).

# Case Studies and Broader Context

### CyberSafety Card Game

CyberSafety Cards is a game developed in 2025 that aims to educate older adults about CyberSafety. The game tackles four main themes: scam protection, password management, cyber attack awareness and privacy protocols. The researchers aimed to create a collaborative, co-designing learning environment through methods and tools such as mixed-method evaluation, think aloud playtesting, surveys and interview. The results of the research showcased that the participants found the game to be educational which overall led to improved cybersafety practices among seniors (Camilleri et al., 2025).






### Dose of Nature

Dose of Nature, established in West London in 2018, is a charity organisations that offers nature-based therapy to individuals struggling with mental health issues, with a specific focus with senior citizens. Outdoor nature sessions guided by nature guides carry the participants through nature walks which improves the mental health of participants by facilitating a reconnection with nature. The initiative has resulted in a 40% decrease in participant GP visits and their levels of anxiety and despair. A notable increase in general life satisfaction must be noted as well. Overall, the cost-effectiveness of the project has resulted in regional health services implementing it as part of their patient care routine (Financial Times, 2025).

# Case Studies and Broader Context

**CyberCycle**
The CyberCyle program leverages virtual reality with in place stationary cycling that enables older adults to participate in “exergaming”. Within the game, participants travel through virtual natural environments whilst simultaneously competing against fellow participants and avatars. Additionally, they are able to monitor their progress over time. According to Anderson-Hanley et al. (2012), participants who utilised CyberCycles had increased cognitive improvements in comparison to their conventional stationary counterparts. The benefits recorded were increased in memory and executive function, consistent engagement and improvement in overall physical and mental well being.




(Tima Miroshnichenko, 2021)



# Overall Reflections

## Implications

There are certainly many positive features and implications to be extracted from the case studies. Firstly, CyberCycle and Lightsword primarily operate within the physical, cognitive and social realm, with interventions providing a boost in participation, engagement, motivation and overall well being. As a result, digital interventions when enhanced with gamified aspects are able to deliver significant measurable wellbeing improvements. This finding elucidates Kappen et al.'s (2018) findings that gamification can improve engagement in elders, most notably in physical activity.

On the other hand, initiatives such as Orono and CyberSafety showcase the ability of community driven initiatives to provide meaningful change. In doing so, the community centric solutions have strengthened community resilience and combatting social isolation. Once again, this echoes Scott et al. (2020), who stated the importance of community, intergenerational knowledge and emotional support during later life stages such as retirement.

Finally, the role of the environment in alleviating feelings of social isolation among elders and increasing feelings of belonging are certainly seen through Dose of Nature. This case study showcases the intentional exposure to green environments can help with improved mental health and wellbeing. Such a case study accentuates the belief that nature should play a core role in designing interventions as outlined in Boffi et al. (2021), who emphasised the importance of exposure to nature through Art Restoration Theory.

## Opportunities

Upon reflecting on the case studies and the outlined literature, a digital intervention through a mobile app that combines social gardening with gamification could potentially encourage older adults to interact with nature and fellow residents in a more enjoyable and purposeful way.

Through this, elders can be supported through modernised technology, which aids them in integration into wider society. Additionally, there are opportunities for collaboration between health organisations such as local and government ministries, NGOs, and entrepreneurs to designers and community groups that could enhance the cultural relevance with the local population and environment. Such interventions, when collaborating with the local community, can increase the effectiveness of care for elders.

## Gaps

There is a gap in the literature and existing cases that leverage digital interventions to address social isolation among elders in Aotearoa. While there were digital interventions through emerging technologies such as VR, there was very little intersection in alleviating social isolation through socialisation and communal aspects.

Furthermore, community gardening case studies such as Orono communicate that there are certainly benefits in fostering long success in helping improve the mental and physical well being of elders. Furthermore, due to the local nature of community gardens, scalability is an issue due to not every community having the necessary infrastructure to facilitate these initiatives. Finally, the literature also showcases a lack of analysis in local cultures and environments, which are particularly important in multicultural communities like Aotearoa, New Zealand.

**Therefore, combining the intersection of social gardening, gamification and digital interventions remains a powerful method in offering older adults a pathway to alleviate social isolation and cultivating a sense of purpose. This showcases a valuable opportunity in creating a mobile based gardening tool that has the potential to fill this gap, simultaneously fulfilling the Green Star Framework requirements for healthier, inclusive and sustainable communities.**

# Process and Methods

For my design methodology, I will be using the human-centred design methodology by IDEO Design studio (IDEO, 2015). Within this methodology, there are three key phases: inspiration, ideation and implementation.

I have decided to utilise this methodology due to its close alignment with my core values of empathy, inclusivity and designing for real change. As a designer who seeks to explore the realm of product design and the objectives of my proposal, this methodology can help facilitate my journey as it emphasises user needs and ongoing collaboration - a key point for designing for communities.

### Inspiration Phase

In the first inspiration phase, I will conduct primary research in order to further my understanding of the problem space. Due to the ethical considerations of this proposal, I will be simulating insights by utilising tools such as user personas and journey maps. Furthermore, I will be conducting further secondary research through academic journals, articles and media releases in order to include more diverse perspectives within the final proposal outcome.

### Ideation Phase

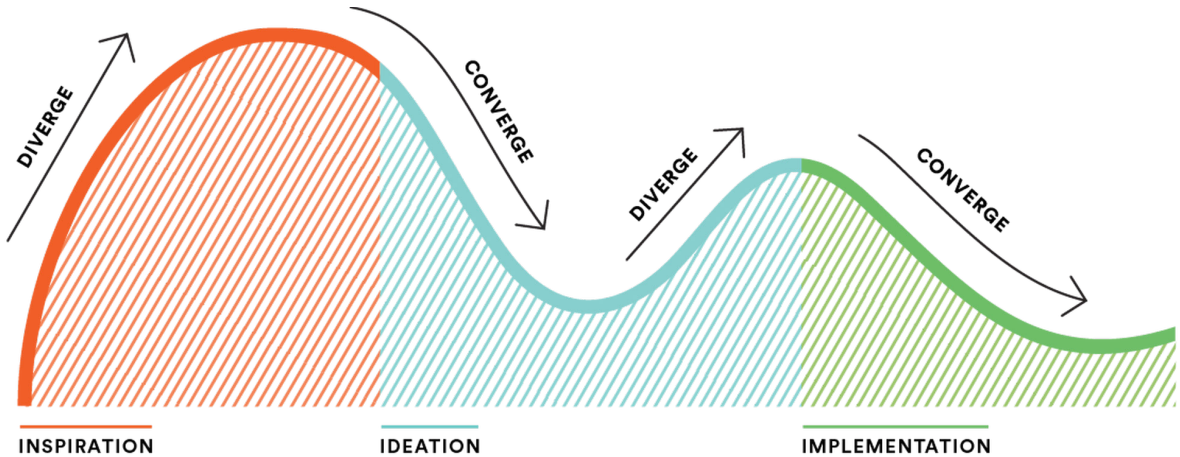
In ideation, I will be converting relevant user insights gathered during inspiration into ideas and creative opportunities. In this phase, I will be utilising tools such as brainstorming sessions, mind mapping and sketching in order to create early concepts. For my problem space, I will also be creating user journey maps, user personas and wireframing potential screens to implement into a final design solution.

Furthermore, ideation surrounding promotional content and other aspects such as branding inspiration will be conducted in order to find the best outcome for the user base. Finally, I will be utilising moodboards as a tool in order to generate further ideation for the purpose of the proposal.

### Implementation Phase

Finally, the implementation phase will ensure that the research within inspiration and ideation is able to translate into the development of low to high fidelity prototypes. During this phase, user testing will involve collecting feedback from peers and simulating insights from usability testing tools.

Feedback will be collected through structured user feedback forms (Google Forms, Miro Feedback) guided walkthroughs and general informal discussion in order to gauge pain points and areas to work on in the prototype. Overall, these methods will be used in order to evaluate the accessibility, functionality and design of the final proposed prototype, whilst simultaneously identifying areas for improvement before moving towards a final real-world implementation.



# Ethical Considerations

Maintaining ethical principles when conducting my research is pivotal given the sensitive nature of social isolation, alienation and loneliness - especially pertaining to a vulnerable population such as elders in Aotearoa.

### Compliance with Guidelines

In accordance to the Guiding Principles for Conducting Research with Human Participants (University of Auckland, 2022), all relevant and primary research that involve human participants must be carried out within the cohort and among peers, unless formal approval is obtained. Due to the unavailability of external ethics approval, all research interactions such as interviews, surveys and co-design sessions will be limited to peers within my cohort. This adherence to university regulation is fundamental in allowing for a safe and controlled research environment, further elucidating the integrity of this research study.

### Informed Constant

I will ensure that all participants receive all relevant detail of research objectives, processes and their legal rights before requesting and receiving consent. Written consent can only be obtained by those who are fit and able and understand the terms outlined. Upon request, participants can withdraw from the research at any time.

### Confidentiaity and Privacy

I will ensure that all research participants will have their data protected by only utilising their data for the research and for no other purpose. I will ensure that data privacy and security steps will be taken such as access only granted to myself and other individuals involved in the research. This approach will make sure that any and all participants will be anonymous when in any publication, report, academic journal or presentation.

### Protection from Harm

The research conducted will be designed to protect participants from physical, emotional and psychological harm. Research participants will not be exposed to any greater risk than the risks encountered within their daily lives. I will consider the vulnerable status of the research population within this study and special care will be taken to protect the participants within each phase of the research process.

### Right to Withdraw

The participants may withdraw from the research at any time for any reason without penalty. They may also request the removal of any given data from the research database.

# Limitations

### Time
I acknowledge that I have only one semester available, alongside balancing other classes, in order to complete the steps outlined within this proposal. Given this tight academic timeline, it limits the opportunities for extended community engagement and launch-ready iterations. As a result, the insights gathered will be based on short-term interactions which may not effectively capture the evolving nature of this topic and population.

### Limited Resources
I acknowledge that the scope of this research is also constrained with restricted access to funding and personnel to support greater software development and participant outreach. Furthermore, considering the individual responsibility of this research, seeking external help is not possible, further limiting the resources available to me.

### Limited Literature and Case Studies
There is a notable gap within the existing literature base and already existing case studies that are within the intersection of gamification, elder wellbeing and community gardening, specifically pertaining to the unique cultural and geographical context of Aotearoa, New Zealand. While literature certainly exists for specific themes, very few explore the integration of one theme unto the other. Therefore, this limitation requires the study to make conceptual bridges between the themes, which may sacrifice theoretical accuracy.

### Sample Size
Due to ethical considerations, participants of this research study will be small and homogenous, primarily consisting of university students or academic peers. In order to compensate for this issue, mock user journeys and personas will be created in order to simulate potential users.



(RDNE Stock Project, 2021)

# Assumptions

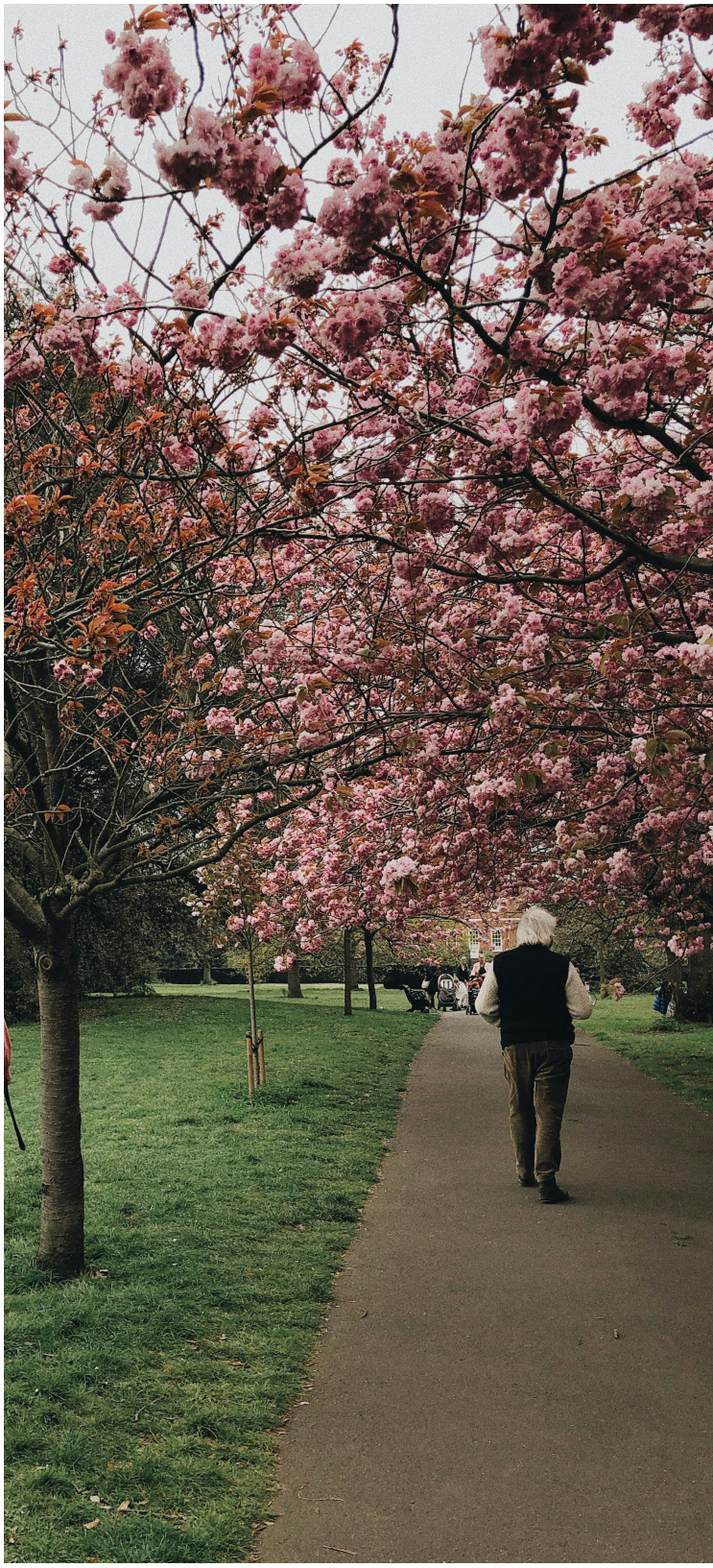
### Homogeneity of Experiences
I am assuming that participants will share common and share experiences relevant to the research focus of social isolation, benefits to connecting with nature, social gardening and the use of digital interventions. Certainly, while the experiences of the individual may differ from the overall collective, this study shall assume a collective experience in order to draw generalised insights. This assumption will serve as the foundation during design sessions, although a wide diversity of perspectives are certainly welcome and shall be reflected upon.

### Participant Honesty and Engagement
This research assumes that all participants will respond truthfully and thoughtful consideration when giving answers during interviews, surveys or workshops.

Furthermore, their active engagement during discussions and insights will be essential in generating meaningful and insightful data, which is fundamental in providing reliable findings within the study.

### Digital Literacy
I assume that participants will possess a basic level of digital literacy necessary to navigate tools utilised within the research and engage in potential prototypes. This assumption ensures that participants can engage with the relevant tasks with relative ease and limited friction. Nevertheless, varying levels of literacy will be present and efforts will be made to accommodate these individuals through accessible design and guided support.

### Positive Impact
It is assumed that on the completion of this research and the implementation of the findings will yield a positive impact for the residents and communities involved. Furthermore, it is assumed that this research will provide specific positive impacts such as enhanced social wellbeing, increased social connection and a deeper connection with nature.



(Pixabay, 2019)

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