An Accessible Garden for CDS: Facilitating Participation, Building Skills, and Raising Awareness

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Recommended Citation
https://scholarworks.wmich.edu/capstone_projects/19
An Accessible Garden for CDS: Facilitating Participation, Building Skills, and Raising Awareness

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Abstract

The concentration area for this doctoral capstone experience (DCE) was program development, which occurred at the Community Connection Skill Building. This site provides services to adults with intellectual and developmental disabilities. Research has found that individuals with developmental and/or intellectual disabilities often face barriers to community participation which can lead to poor health outcomes, engagement in more sedentary activities, and a reduction in quality of life. Participation in garden-based activities can promote health and wellbeing and establish a sense of purpose within the community. A needs assessment at the DCE site revealed the need for additional programs that provide community participation and opportunities for skill building. To address those needs, three wheelchair accessible raised beds were built and a corresponding accessible gardening program was developed for participants receiving services at the Community Connections Skill Building. The design of the garden beds presents opportunities to be utilized in various occupational therapy (OT) practice settings as part of a therapeutic intervention. Additionally, creation of this program demonstrated the benefits of inclusive program development utilizing an OT perspective and highlights the need for OTs in nontraditional settings.
Introduction

Doctoral Capstone Project and Experience Setting

This Doctoral Capstone Experience (DCE) occurred at the Community Connections Skill Building, a constituent of the Center for Disability Services (CDS) on Western Michigan University’s (WMU) Campus in Kalamazoo, MI. The mission of the Center for Disability Services is to “help people who are aging, living with an illness or disability or need special assistance live life to the fullest” (CDS, 2022, p.1). Their vision is to “provide high quality supports and services and to help all people be active members of their community and achieve the highest quality of life” (CDS, 2022, p.1). CDS is a multi-service agency that offers services to adults within the community while improving the physical, emotional, and/or intellectual health of each participant (CDS, 2021). It provides internship, volunteering and employment opportunities for both undergraduate and graduate students attending Western Michigan University (CDS, 2021). According to the 2021-2022 Center for Disability Annual Report, CDS served over 250 individuals attending their programs, hosted 105 intern and practicum students from an array of disciplines, and employed 91 WMU students. The programs through CDS are supported by the College of Human and Health Services (CHHS; CDS, 2021) and provide opportunities for students from the allied health disciplines to learn more about supporting adults with disabilities especially as they age.

The primary purpose of the Community Connections Skill Building, where this DCE occurred, is to provide opportunities for community involvement in order to improve independence, develop a sense of belonging to the community, and build skills to increase success (Community Connections Skill Building, 2023). It offers day services to adults and older adults with intellectual and developmental disabilities. It is committed to the philosophy of community inclusion and focuses on improving the health of the whole person (Community Connections Skill Building, 2023). This includes addressing the physical, emotional, and/or
intellectual needs of each individual. Individuals attending the Community Connections Skill Building are able create their own daily schedule by choosing which activities they wish to participate in utilizing person-centered planning (PCP). Occupational and physical therapy graduate students have the opportunity to complete fieldwork experiences at the Community Connections Skill Building, which is how the doctoral capstone student was first introduced to this setting. Approximately 80 individuals with various intellectual or developmental disability diagnoses, such as autism spectrum disorder or Down Syndrome, currently receive services through the Community Connections Skill Building.

**Doctoral Capstone Project and Experience Site Mentors**

Site mentorship for this DCE/Capstone Project was provided by two professionals, Sandra Wagner, MA, BCBA, LBA, and Andrea Perez, PhD, BCBA. Both site mentors have a wealth of experience and knowledge working with individuals with intellectual disabilities and site-specific knowledge regarding the daily operations of the Community Connections Skill Building. They provided mentoring, guidance and feedback during different phases of the Doctoral Capstone.

Sandra Wagner, the current Program Coordinator for the Community Connections Skill Building Day Program at CDS, was the primary site mentor during the implementation and dissemination phases of the Doctoral Capstone. As Program Coordinator, Wagner is in charge of overseeing the operations of the Community Connection Skill Building, which includes maintaining documentation, recreating/ revising systems to increase staff performance efficiency, collaborating with treatment teams, and overseeing the training of direct care staff. She has had several years of experience working with individuals with intellectual disabilities in various settings across the lifespan, including outpatient clinics, nursing homes, and day centers. She is currently working toward her Doctorate of Philosophy in Behavior Analysis. She has been a Board-Certified Behavior Analyst since 2018, and has been licensed and practicing
in the state of Michigan since 2020. Wagner has over 10 years of research experience with publications, such as a recent three-year project that provided behavioral interventions to older adults with cognitive impairments in skilled nursing facilities. Wagner has also gained teaching experience as the instructor on record for an introductory aging studies course taught at WMU. These experiences as well as her passion for working with individuals with intellectual disabilities contributed to the advancement of the doctoral student’s own knowledgebase and skillset regarding program development for individuals with intellectual disabilities.

Andrea Perez was the primary site mentor during the development phase of the DCE. She is the former Program Coordinator for the Community Connections Skill Building (2020-2021) and the current Director of the Center for Disability Services. She is also a current committee member for the College of Health and Human Services Office of Diversity and Equity and Inclusion. Perez has been working with individuals with disability for over 10 years. She has had teaching opportunities as an instructor in psychology courses, a practicum supervisor for students in behavior analytic practices, and group supervisor for graduate students in behavior analysis. She has been involved in several research projects working with individuals with neurocognitive disorders and has several publications working with related populations. Perez’s drive, knowledge, and passion for working with individuals with disabilities assisted the doctoral student in developing the final plans for their doctoral capstone project and obtaining funding through a grant.

**Doctoral Capstone Project Focus**

The ACOTE concentration area for this doctoral capstone experience was program development. For this specific project, a manualized accessible gardening program was developed in order to address the physical, emotional, and social needs of the participants attending the Community Connection Skill Building. Three wheelchair accessible raised garden beds were also built on site in order to implement the accessible gardening program while
respecting person-centered planning. No prior gardening program had been established at this center, therefore, the development of the inclusive gardening program was a novel project.

**Literature Review of Capstone Project**

**Intellectual and Developmental Disabilities Overview**

In the United States, approximately 1% of the adult population is living with an intellectual or developmental disability (Anderson et al., 2019). According to the Centers for Disease Control and Prevention (CDC, 2021), an intellectual disability (ID) is a condition that impacts one’s ability to learn and adapt to the demands of daily life. Similarly, a developmental disability (DD) also impacts one’s ability to function in daily life as a result of a physical, learning, behavior, or language impairment (CDC, 2021). Due to these deficits, individuals with either an ID or DD often experience barriers to community participation (Amado et al., 2013; Johnson et al., 2019). This often results in participation in more solitary and sedentary activities and can lead to feelings of isolation (Amado et al., 2013; Johnson et al., 2019). In turn, feelings of isolation can lead to poorer mental and cardiovascular health (Leigh-Hunt, 2017). Additionally, adults with ID often experience social exclusion due to barriers that prevent interactions with friends (Wilson et al., 2016). These factors, emotional-wellbeing, social inclusion, and physical wellbeing are all indicative of a person's quality of life (Friedman, 2018). Thus, it can be postulated that poorer mental health, feelings of isolation, and limited community participation can lead to a reduction in quality of life. Therefore, to address quality of life and attain true social inclusion, presence in the community and participation in fulfilling social activities with meaningful social connections must occur (Wilson et al., 2016).

A newer approach to identify and provide individualized supports with the goal of improving the quality of life for an individual with ID is known as person-centered planning (PCP; Ratti et al., 2016). Preliminary results in a meta-analysis conducted by Ratti et al. (2016) suggest PCP can have a positive impact regarding community participation in individuals with
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ID. A few key qualities of PCP include placing the individual at the center of the planning process, recognizing their unique interests and strengths, and emphasizing the importance of collaboration and shared power when making decisions (Ratti et al., 2016). Based on these findings, PCP can be utilized to help facilitate involvement in meaningful activities, such as community participation.

Although strides have been made to make community participation more accessible, such as through the use of PCP, true social inclusion is still often not achieved (Amado et al., 2013; Johnson et al., 2019). The Americans with Disabilities Act (ADA; Americans With Disabilities Act, 1990), along with organizations and agencies within the US, have taken strides to promote this vision of true social inclusion (Amado et al., 2013). The Center for Disability Services (CDS), a part of Western Michigan University, is an example of such an agency who shares this vision and has dedicated its time and resources to ensure they offer programs that provide community inclusion for people with ID and DD. Per discussions with both site mentors, CDS, and specifically the Community Connections Skill Building, continue to seek out programs that provide opportunities for community engagement for their members.

Nature-Based Programing

Previous research has found participation in nature- and garden-based activities can promote wellbeing and a sense of purpose within the community (Lai et al., 2017; Vujcic et al., 2017; Joy et al., 2020). There are many other benefits of participating in a community or therapy garden program. Garden maintenance requires physical activity, which can lead to improvements in strength and balance (Winterbottom & Wagenfeld, 2015; Maier & Jette, 2016). Physiologically, blood pressure and heart rate decrease when one spends time in nature, such as during gardening (Winterbottom & Wagenfeld, 2015; Thompson, 2018). Gardening presents opportunities for collaboration and social interaction, which can improve social skills (Winterbottom & Wagenfeld, 2015; Lai et al., 2017; Maier & Jette, 2016; Joy et al., 2020).
Gardening can improve mental health and reduce stress and anxiety (Winterbottom & Wagenfeld, 2015; Thompson, 2018). Lastly, participating in a community garden program can provide a sense of purpose, empowerment, and control (Winterbottom & Wagenfeld, 2015; Maier & Jette, 2016). The rationale for these improvements can be explained through emerging theories, which state that humans have evolved with nature and therefore can relax, heal, or replenish more quickly when they have contact with nature (Oh et al., 2020). Based on these findings, it is apparent that nature- and/ or garden-based programs can promote wellbeing and social interactions.

Although participation in nature-based activities has positive outcomes, there is little research exploring the impact of nature-based activities specifically with individuals with ID/ DD. There have been a few studies exploring the use of horticultural therapy (HT) with individuals with ID/ DD (Lai et al., 2017). The goal of HT is to promote “physical, psychological, cognitive, and spiritual health” (Lai et al., 2017, p. 4) through engagement in horticultural activities. In one HT study, Lai et al. (2017), developed a 12-week gardening program for individuals with ID. Results demonstrated improved social self-efficacy and competence for participants (Lai et al., 2017). In a second study conducted by Joy et al. (2020), individuals with ID cultivated succulent plants for vocational training. Findings were consistent with Lai et al. (2017) where participants demonstrated improved social skills (Joy et al., 2020). Additional benefits included improved emotional behavior and finger dexterity (Joy et al., 2020). Overall, based on general and population specific studies, it is apparent that nature-based and gardening programs may provide many benefits specifically for adults with ID and DD.

**Needs Assessment**

A needs assessment was conducted with key stakeholders of CDS in early 2022 followed by a Strengths, Weaknesses, Opportunities, and Threats (SWOT analysis), to identify current needs at the Community Connections Skill Building. Prior to the COVID-19 pandemic,
participants at the Community Connections Skill Building had many opportunities to participate in community-based activities. During the COVID-19 pandemic, restrictions limited opportunities for community outings. As mentioned previously, a reduction in community participation can have negative impacts on one’s quality of life, health, and lead to feelings of social exclusion (Wilson et al., 2016; Leigh-Hunt et al., 2017; Johnson et al., 2019;). Additionally, as noted in the literature review, individuals with ID/DD often participate in more sedentary activities (Amado et al., 2013; Johnson et al., 2019). Lastly, it was brought up that there were currently no nature-based programs at the Community Connections Skill Building even though there is evidence to support to positive benefits of nature-based programs. Therefore, a need for a program that provided opportunities for community participation, interacting with nature, and physical activity was identified.

By the start of the DCE, most COVID-19 restrictions had been lifted. A new needs assessment occurred with Wagner to ensure the capstone project still met the needs of the participants at CDS. Per discussions, it was noted that CDS also strives to utilize PCP by giving the participants the autonomy to create their own daily schedules. An additional program would provide greater variety in activity selection for the participants. Furthermore, some participants still did not feel comfortable traveling away from the site. A gardening program offered opportunities for community participation while respecting a desire to remain on site. Lastly, one of the goals at the Community Connections Skill Building is to facilitate the development of skills needed to be successful in daily life. A gardening program presented new skill building opportunities.

Objectives

Overview of Student Site Specific Objectives

Below is a list of the student site specific objectives that were developed to address the needs identified at the capstone site.
1. To design and construct a wheelchair accessible, raised garden bed to enhance participation of adults with developmental and intellectual disabilities (DD/ID) attending the Community Connections Skill Building.

2. To develop and implement a manualized gardening program to use in tandem with the accessible garden beds that addresses psychosocial, physical, and social deficits experienced by adults with DD/ID attending the Community Connections Skill Building.

3. To conduct two feedback group sessions of 5-7 individuals each, with one including participants at CDS and the other including CDS stakeholders, to improve the manualized program.

**Student Site Specific Objective 1**

In order to achieve this objective, self-directed study regarding wheelchair accessible raised garden bed designs, gardening maintenance and planting occurred. After reading literature on wheelchair accessible raised beds, an online search utilizing the terms “wheelchair accessible” and “garden beds” was implemented to browse potential concept designs that met the needs of the Community Connections Skill Building. The initial concept design for the raised beds was generously provided by Gardens for Humanity, an organization in Sedona, AZ that designed and built accessible planters for the Sedona Winds Assisted Living Center (Figure A1). After the initial concept design was established, Christopher Imler, a Consumer and Veterans Horticulture Educator through Michigan State University Extension was contacted. He provided consultation regarding construction and maintenance logistics during the planning and implementation phases of the capstone project. Through discussions with Chris, modifications to the original concept design were made and a final draft for the raised beds was established.

The funding required to purchase the materials for the raised beds was acquired through WMU’s Student Sustainability Grant (SSG). A total of $5,642.20 was awarded through the SSG to purchase the needed materials for the raised beds and the gardening program (see Figure
A2 for full list of materials used. The doctoral capstone student also established partnerships with various organizations including CanDo Acres, and Alpaca Farm in Paw Paw, MI to procure additional needed materials and labor. At the start of the implementation phase of the capstone project, contact was initiated with WMU’s Facilities Management to hire a project manager to oversee construction of the raised beds. A consultation meeting with the project manager occurred during the first month of the DCE to finalize the design of the raised beds. The raised beds were completed and delivered at the beginning of April 2023 (Figure A3). A total of $4,767.27 was spent constructing the beds and the remainder of the funds were used to purchase gardening supplies and materials for the gardening program. After delivery occurred, participants assisted with decorating the raised beds to promote ownership.

**Student Site Specific Objective 2**

To achieve this objective, self-directed study regarding program development, horticultural therapy, and accessible gardening was implemented. During the planning phase of the capstone project, the capstone student attended a Gardening Series session titled *Adaptive Gardening for Health and Wellbeing*, hosted by the Michigan Horticultural Therapy Association. During the initial few weeks of the implementation phase of the capstone project, a literature review regarding gardening programs within the fields of horticultural and occupational therapy occurred. Additionally, review of the Michigan Horticultural Therapy Association virtual conference 2021 sessions provided examples of therapeutic gardening activities. Observations, interactions, and interviews with staff and participants at the Community Connections Skill Building occurred during the first two months of the DCE to identify participant strengths, needs, and interests. The volitional questionnaire (VQ; Heras, 2007) was utilized to measure participant engagement in various activities prior to and during the gardening program. Results from the VQ were utilized internally only to inform decisions during the program development and revision processes. After an initial outline of the program was created, drafting of the manual
occurred over the course of several weeks. Feedback groups were recruited to provide feedback regarding the initial draft of the manualized program. Revisions were made based on the feedback prior to initiating the gardening program.

During the DCE, the indoor portion of the gardening program was implemented. Gardening sessions were held biweekly for approximately 35-45 minutes with groups ranging from 3-8 participants starting the tenth week of the DCE. Each session presented participants with a new plant variety to sow indoors (Figure B1). A warm-up activity, such as plant yoga (Figure B2), was initiated prior to the gardening portion of the session to warm up bodies before meeting the physical demands of gardening. Mood was assessed at the start and end of every session utilizing a modified visual mood scale similar to the Wong-Baker FACES Pain Scale (Wong-Baker FACES Foundation, 2020). Results from this assessment were utilized internally to provide preliminary results on the gardening program’s impact. Supplies for the gardening sessions were purchased through the funds received from the SSG. During the last week of the DCE, a physical and digital copy stored on Google Drive of the manualized gardening program was given to Wagner (Figures B3 & B4). The manual created was divided into three main sections: (1) maintenance of the garden beds and gardening logistics (Figure B5), (2) gardening program session plans (Figure B6), and (3) visual aids and support documents (Figure B7).

**Student Site Specific Objective 3**

Self-directed study regarding focus groups was initiated during the first few weeks of the implementation phase of the capstone project. Discussions with Wagner during the first two site mentor meetings were utilized to identify the goals of conducting focus groups. Comparing the identified goals with focus group requirements, it was decided to modify this student specific object to utilize feedback groups instead. With Wagner’s support, CDS stakeholders and participants were identified and recruited during the fourth week of the DCE to participate in the feedback groups. A questionnaire was created (Figure C1) with a mixture of open and close-
ended questions to help guide the CDS stakeholder feedback session based on discussions with Wagner. Visuals aids were developed (Figure C2) to assist with communication during the feedback session with the participants.

Feedback groups were conducted during the sixth week of the DCE. The initial feedback group was composed of CDS stakeholders including CDS supervisors, psychology practicum student supervisors, and an Integrated Health Science intern who had expressed interest in accessible gardening. In this session, group members were asked to provide feedback regarding the format and content in the manualized program. Additional supports regarding plant care and garden bed maintenance were expressed as needs during the session. The second feedback group consisted of 5 participants attending the Community Connections Skill Building. Questions were asked regarding participant interest in outdoor-based activities, gardening, responsibilities associated with gardening, activities associated with gardening, and plant preferences for the garden beds. Feedback from both sessions were utilized to make modifications to the manualized gardening program created so that needs of both staff and participants were addressed.

Implications

Impact

Engagement in the gardening sessions has provided participants with physical exercise and opportunities for social engagement and skill development. Additionally, the responsibilities associated with caring for the planted seedlings has provided participants with a sense of purpose. The students completing their psychology practicums at the Community Connections Skill Building have been able to include these tasks into their own sessions with participants through the use of picture exchanges. For participants who do not feel comfortable traveling away from the Community Connections Skill Building, the gardening program has provided them with the opportunities to engage in community participation. Preliminary results and
feedback from CDS/Supervisors have indicated participant enjoyment and engagement with the gardening program. One participant noted they now enjoy gardening and like to watch the seeds grow. Staff involved in the gardening sessions were able to learn how to grade gardening activities to meet the needs of the participants and enhance their own knowledge on gardening practices. Per feedback provided during sessions, some even felt inspired and confident to garden at home. Lastly, participants have been able to leave their own lasting mark on the raised beds by being actively involved in the decorating process, thus providing a greater sense of ownership.

**Sustainability**

Manualizing the gardening program ensures that the materials and tools are in place for continued implementation of the gardening program in the years to come. CDS employees had opportunities to observe or actively participate in gardening sessions. Education regarding grading of gardening tasks and gardening practices was also provided during sessions to ensure staff felt confident to run sessions independently. A partnership with the doctoral capstone student’s chapter of the Student Occupational Therapy Association (SOTA) was formed to ensure continued maintenance of the raised beds (Figure A4). Additionally, partnerships with CanDo Acres and VanderSalm’s Flower Shop & Garden Center were formed to ensure gardening materials and plants are available, free of charge, in the years to come. Consulting with Chris Imler and utilizing the raised garden bed design provided by Garden’s for Humanity ensures that the constructed raised garden beds are durable and should withstand the harsh Michigan winters for several years.

**Implications for OT**

As mentioned previously, there are very few published studies utilizing gardening-based activities in the field of occupational therapy, especially with individuals with ID/DD. As a matter of fact, Wagenfeld & Atchinson (2014), explicitly recommend the need for evidence-based
research regarding the efficacy of a garden-based intervention. Therefore, the raised beds and gardening program present the opportunity to be utilized in a pilot study to assess the impact of a gardening program on a variety of client goals. Occupational therapy students completing their level 1 fieldwork placements at the Community Connections Skill Building are perfectly situated to utilize the beds and program in a study. As part of their level 1 experience at CDS, current OTD students hold biweekly group sessions with the participants under the support and guidance of a clinical fieldwork supervisor.

Additionally, the design of the wheelchair accessible beds presents opportunities to be utilized in other occupational therapy practice settings. Besides being wheelchair accessible, the beds contain casters, which makes them mobile. Both these features make present the possibility of these beds being usable in a variety of settings to accommodate a variety of populations. In their survey, Wagenfeld & Atchison (2014) argue that occupational therapists are uniquely qualified to utilize gardening as a therapeutic approach to intervention due to their expertise in adaptation and modification of activities. Therefore, this concept design can be utilized to enhance interventions for clients who have identified gardening as a meaningful occupation.

Lastly, creation of the accessible raised garden beds and corresponding gardening program has highlighted the benefits of program development utilizing an occupational therapy lens. The ability to grade activities and incorporate adaptive equipment while respecting the whole person is central to an occupational therapist's ability to develop interventions. The skillset an occupational therapist possesses aligns with skills required to create inclusive programing that can cater to a variety of populations. Completion of this DCE in program development has illuminated the importance of advocating for the need of occupational therapists in nontraditional settings such as program development.
Conclusion

Lessons Learned

One of the biggest lessons learned during the development of the program sessions was the importance of creating a program that truly honors the setting and individuals utilizing the program. The initial draft of the manualized program, particularly the sessions plans, was wordy. It provided detailed information on how each session should be run, down to the phrasing to use. Additionally, warm-up activities were developed to be session specific. Through interactions with the participants and staff at CDS, as well as implementation of the indoor gardening sessions, it became apparent that this was not the best format. It was a wonderful reminder that every individual is unique. Ability levels, interests, and day to day operations all impact an individual’s ability to engage in a session. Providing a more general outline for sessions plans allows staff greater opportunities to customize the sessions specifically for the participants present. It provides greater buy-in to the program because staff are able to interpret and implement the sessions plans in a way that reflects their own personalities and preferences.

Another valuable lesson gained through completion of this DCE was the importance of intraprofessional collaboration. It was imperative to develop effective communication and intraprofessional collaboration skills during the DCE at CDS. The communication and collaboration skills needed in this setting differed from the interprofessional collaboration and communication skills utilized by the doctoral capstone student during their level II fieldwork placements. Early on, it was apparent that the professionals, students, employees, and volunteers working at the DCE site all had unique insight into participant preferences, strengths, and needs. Collaborating intraprofessionally, and developing the communication skills to be successful in this endeavor, were important during the planning and initial development of the program and ensured participant needs were met while upholding CDS’ mission and values.
Recommendations

Due to the timing of the DCE, the entire manualized program was not implemented prior to the end of the DCE. The outdoor portion of the gardening program, which consists of transplanting and harvesting plants, was not initiated. Due to this timing issue, not all of the garden sessions were trialed and modified to ensure they were formatted to enhance participation. Any future doctoral capstone students working with the gardening program may want to modify the start and end times of the implementation phase of the capstone project. Finishing the DCE before completing the gardening program did not allow for any meaningful analysis regarding the success of the gardening program and prevented the current doctoral capstone student from overseeing program implementation all the way through to the end.

One additional recommendation for any future doctoral capstone students completing a DCE at CDS is to ensure they take the time to fully integrate themselves. The current doctoral capstone student was able to complete one of their Level I Fieldwork experiences at the Community Connections Skill Building prior to the DCE which gave them invaluable insight into the day-to-day operations. Nonetheless, they found that during the initial few weeks of the DCE, seeking opportunities to observe other disciplines conduct their sessions provided them with greater understanding regarding the various contributions that stakeholders at CDS make. Additionally, taking time early on to develop rapport with the participants receiving services at the Community Connections Skill Building created a more meaningful DCE. For any future students, embrace any opportunity to interact with the participants and be proactive to make those opportunities happen.
References


Appendix A

The Wheelchair Accessible Raised Garden Beds

Figure A1: Screenshot of original raised bed concept developed by Gardens for Humanity

Figure A2: Screenshot of initial list of project materials submitted for the SSG

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<tr>
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<td>Total</td>
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AN ACCESSIBLE GARDEN FOR CDS

Figure A3: Picture of the built wheelchair accessible raised beds for CDS

![Image of accessible raised beds]

Figure A4: Screenshot of proposed SOTA responsibilities for the accessible garden at CDS

Winterizing Raised Garden Bed

The following is a list of tasks to "winterize" your raised garden bed. This is usually completed after a hard freeze occurs.

1. Remove remaining plants from garden beds and discard them.
   - Optional: Dig up the chives and transplant them into a pot to continue to grow over the winter.
   - Optional: Dig up Rosemary and transplant it into a pot to continue to grow over the winter.
2. Remove any plant markers or stakes.
3. Remove drip irrigation system. Make sure to empty all water from the irrigation tubing and store the system indoors for the winter.
4. Assess the planter. Fill out maintenance log form if any problems are identified.
5. Dig leaves into soil. Mix a handful of leaves into the top layer of the soil (~6-12").
6. Cover raised garden beds with a plastic tarp. Secure tarp with string.
7. Optional: Bring raised garden beds inside for the winter.

Preparing Raised Garden Bed for Planting in the Spring

Below is a list of tasks to complete to prepare your raised garden beds for the new season. This is typically performed 1-2 weeks before planting in beds (late March).

1. Remove the tarp from the garden beds and roll them into a sunny area outside.
2. Review the maintenance log for any needed repairs and reinspect raised beds for any additional problems that may have popped up over the winter. Observe for cracked wood, chipping paint, loose screws, etc.
3. Make needed repairs using spare parts/materials provided. Contact facilities maintenance with any old repairs needed such as broken casters.
4. Add new compost to top off raised garden beds donated by Can Do Acres Farm. You should fill the beds so that there are only a few inches (3-4") of clearance from the top. Use the following soil recipe when adding compost:
   - Two parts compost
   - One part peat moss
   - One part perlite
   - Example: 2 cups compost, 1 cup peat moss, 1 cup perlite
5. Set up and test drip irrigation systems. Reconnect faucet adapters to manifold and replace the end caps to the 1/2" tubing. Connect to a water source and assess integrity of irrigation system, looking for areas of leakage. Once clear of major leaks, place irrigation systems back in the raised garden beds
6. Reinstall drip irrigation systems once clear of frost.
7. Check soil moisture levels with soil tester. Turn on the irrigation systems for 1-2 hours if beds are dry (Moisture =4).
Appendix B

The Manualized Garden Program

Figure B1: Picture of seeds started during indoor portion of gardening sessions

Figure B2: Excerpt from manual depicting one created warm-up activity

Note. Behind the overview page are materials needed to implement the warm-up activity.
Figure B3: Picture of physical copy of manualized gardening program

Figure B4: Screenshot of digital copy of manualized gardening program
Figure B5: Screenshot of excerpt from the maintenance and gardening logistics section of the manualized gardening program

![Planting Timeline](image)

The timeline above presents a general guideline of when to start seeds indoors/outdoors. More detailed information is provided below for each plant variety. As a general rule of thumb, most plants should not be transplanted or directly sown outdoors until the last frost of Spring has occurred. The harvest period is also an estimate and is dependent on the occurrence of frost in the fall. For instance, if a warmer fall season occurs, plants may be harvested for a longer period of time.

Figure B6: Screenshot of excerpt from the session plan section of the manualized gardening program

### Session 1: Introduction to Gardening

**Session Objective(s):**
- Utilize fine and gross motor skills to complete plant craft
- Utilize turn taking to complete craft

**Materials (1 per participant):**
- 1 sheet of construction paper (background)
- 1 cupcake liner
- 3-4 dried beans or seeds
- 3-4 pieces of string (~3’ long)
- 1 of each plant parts/ needs labels
- 1 of each plant parts/ needs pictures
- 2 green paper leaves
- 1 green straw/ pipe cleaner
- 1 piece of brown construction paper (soil)
- Glue-liquid
- Sample completed craft

**Prior to Session Set Up:**
- Ensure paper leaves, string for roots, and brown paper for soil are already cut to correct size.
- Gather needed materials- may recruit participant to assist using visual aid

**Session Plan:**

- **Warm-Up Activity:** Select one from provided to implement (located in binder)

**Main Activity: Craft**
1. State purpose of the activity: create a craft showing the parts of a plant and the needs of a plant.
2. Show Participants sample of completed craft.
3. Read off the parts of the plant as well as the plant needs from the sample craft, pointing to the correct location on the plant diagram:
   - **Grade Up:** Ask volunteers to verbalize plant parts and (if able) walk up to sample and point out the part
   - **Grade Down:** Provide printed picture of plant anatomy to participants and point
Figure B7: Screenshot of excerpt from the visual aids and support documents section of the manualized gardening program
Appendix C

Feedback Sessions

Figure C1: Excerpt from feedback form created for CDS Stakeholder feedback session

1. What is your current level of comfort with gardening?

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<tr>
<td></td>
<td>4</td>
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<tr>
<td></td>
<td>5</td>
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</table>

2. What is your current level of knowledge regarding gardening practices?

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</tr>
</thead>
<tbody>
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<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

A lot of Knowledge

3. What do you need to feel comfortable/ confident assisting/ maintaining a gardening program?

4. What goals would you like to see addressed for the participants?

5. What suggestions do you have for the raised bed/ program or what would you like to see included?

6. What are your thoughts regarding the format of the manual (labeling parts, activities, info)?

7. How do you learn best? What learning formats can I provide to help?

8. What reservations do you have about this program?

Figure C2: Excerpt from visual aid documents used during participant feedback session