

**The Design Of A Horticultural Therapy Model And A  
Practical Business Plan For A Horticulturist  
Interacting With A Healthcare Worker.**

by

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## Declaration

I, the undersigned, hereby declare that the work submitted in this thesis is my own original work and has not previously in its entirety or in part been submitted at a tertiary educational institution for a diploma or a degree.

Signature: October  
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Date: 1 November 2004

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**IN LOVING MEMORY OF MY MOTHER**

Roslyn October

(1944 – 2002)

## **Abstract**

The term "horticultural therapy" is unfamiliar to most South Africans. However it is well accepted in South Africa that horticulture plays an important role in human well being both physically and psychological. It is generally believed that people who engage in gardening tend to benefit. The research study investigates whether plant related activities integrated into rehabilitation programme, actually benefit participants. It shows how patients at a chosen healthcare institution respond upon exposure to various horticulture activities in order to identify activities appropriate for the inclusion and design in a horticultural therapy programme. The study identifies factors necessary for the design of a business plan for a horticulturist engaging in a horticultural therapy programme under local conditions.

The methodology adopted was mainly quantitative. The study is also descriptive in nature. It seeks to develop a model from a range of activities that would best meet the needs of specific groups subjects, through the careful and deliberate observation and evaluation of patients as they engage with the activities. The measuring instruments have been designed for experimentation research purpose. It involved setting up an experiment (patients engaged in a designed horticulture activity) and collecting the data. Information regarding the participant response to designed activities was also gathered on the basis of observations and interviews.

The population consisted of patients admitted at a public (State) psychiatric institution in the Western Cape. The sample consisted of 12 patients, four patients from each of the following categories: Forensics, Intellectually Challenged, and Psychiatric.

The designed activities consisted of 10 activities, and were centered around the following activities: Growing of herbs, learning to take cuttings, planting cuttings,

planting seeds for outdoor garden, preparing a garden site, vegetable gardening, weeding, watering, and planting flowering annuals.

The first objective of the study was to determine whether the response of different categories of patients to specific horticulture activities differ, in order to select the appropriate activity for each category. Forensic patients responded positively to all ten activities and recorded a high level (70%) of task accomplishment. Intellectually challenged patients had a medium level (46% to 69%) of task accomplishment for the majority of the activities. Psychiatric patients had a high level (70%) for 50 percent of the activities and a medium level (46% to 69%) of task accomplishment for the remainder of the activities.

The second objective of the study was to evaluate the degree of effect of the different horticulture activities on each category of patients, in order to determine the relative importance of each activity in the programme in meeting the patients needs.

The general findings are that the various categories responded differently to the subsections as shown in the results. Individual patients within the categories also differed in their response to various activities. The results of the study indicate that certain horticultural activities have an impact on patient's deficiencies and encourage their specific needs in the areas of avoactional/educational, interpersonal/social, and responsibility/development

The study identified factors necessary for the design of a business plan for a horticulturist to engage in a horticultural therapy programme under local conditions. The business plan provides an outline to develop, market, and implement a horticultural therapy service. The business plan helps identify important ramifications of setting up a business and practicing as a contract worker.

The research process has highlighted valuable aspects, which may be easily incorporated into a future horticulture therapy programme. It has shown that certain plant related activities, when successfully integrated into a rehabilitation programme, will benefit participants. The findings and recommendations provide guidelines for the formulation of a structured horticultural therapy programme. It encourages the concept of utilizing gardening in a structured/organized manner to benefit the well being of individuals.

## TABLE OF CONTENTS

<b>1.</b>	<b>INTRODUCTION</b>	<b>1</b>
1.1	Historical Overview	1
1.2	Universal Importance Of Horticulture As A Therapy	1
1.3	Importance Of Horticulture As A Therapy In South Africa	2
1.4	Objective Of The Study	4
1.4.1	Statement Of The Problem	4
1.4.2	The Setting Of The Problem	6
<b>2.</b>	<b>REVIEW OF RELATED LITERATURE:</b>	<b>8</b>
2.1	Introduction	8
2.2	The Evolution Of Horticultural Therapy – A Historical Perspective	8
2.3	Cultivating The Concept: The 'Therapeutic Landscape'	9
2.4	Design Considerations For The Development Of Therapeutic Gardens	10
2.5	Understanding The Environmental Cues When Designing Gardens For Emotional Restoration	16
2.6	Horticultural Therapy Services Offered By Public Gardens In The United States	18
2.7	How Horticultural Therapy Relates To Human Beings	18
2.8	Psychological Principles Applied In Horticultural Therapy	19
2.9	<i>Developing A Comprehensive Horticultural Therapy Programme In A Challenging Environment</i>	20
2.10	Studies Illustrating The Benefits Of Horticultural Therapy	22
2.11	Standards Of Practice Essential For A Quality Horticultural Therapy Service	26



2.12	Components Of Rendering A Horticultural Therapy Service	28
2.13	Establishing The Correct Project Research Fundamentals	28
2.14	Summary	30
<b>3.</b>	<b>RESEARCH DESIGN AND METHODOLOGY:</b>	<b>32</b>
3.1	Introduction	32
3.2	Research design	33
3.3	Methodology	34
3.4	Treating The Data	37
3.4.1	Demographic Variables	37
3.4.2	Sample	38
3.4.2.1	Definition Of The Sample	40
3.4.2.1.1	Forensics	40
3.4.2.1.2	Psychiatric	41
3.4.2.1.3	Intellectually Challenged	42
<b>4.</b>	<b>DESIGNED HORTICULTURE ACTIVITIES AND ITS IMPLEMENTATION</b>	<b>44</b>
4.1	Description Of The Activities	45
4.2	Grading of Horticulture Activities	46
4.2.1	Implementation Of Horticulture Activities	49
4.3	Content Of Designed Horticulture Activities	50

<b>5.</b>	<b>RESULTS AND DISCUSSION:</b>	<b>62</b>
5.1	Introduction	62
5.2	Description Of The Sample	63
5.3	Presentation Of The Data	67
<b>5.3.1</b>	<b>Subproblem 1</b>	<b>67</b>
5.3.1.1	Patient Group Response To Activities 1 To 10	69
5.3.1.1.1	Forensics Patients	69
5.3.1.1.2	Intellectually Challenged Patients	70
5.3.1.1.3	Psychiatric Patients	72
5.3.1.1.4	Hypothesis no.1	72
5.3.1.1.5	The Importance Of Non-Horticultural Tools As Research Tools	73
<b>5.3.2</b>	<b>Subproblem 2</b>	<b>74</b>
5.3.2.1	Patient Group Response To Sub-Section Avocational/Educational	77
5.3.2.1.1	Forensics Patients	77
5.3.2.1.2	Intellectually Challenged Patients	77
5.3.2.1.3	Psychiatric Patients	77
5.3.2.1.4	The Implication of Greenhouse Work And Outdoor Space As A Form Of Horticultural Therapy	78
5.3.2.2	Patient Group Response To Sub-Section Interpersonal/Social	79
5.3.2.2.1	Forensic Patients	80
5.3.2.2.2	Intellectually Challenged Patients	80
5.3.2.2.3	Psychiatric Patients	81

5.3.2.3	Patient Group Response To Sub-Section Responsibility	82
5.3.2.3.1	Forensic Patients	83
5.3.2.3.2	Intellectually Challenged Patients	83
5.3.2.3.3	Psychiatric Patients	83
5.3.2.4	Individual Patient Response Within Each Category	84
5.3.2.4.1	Forensic Patients	84
5.3.2.4.2	Intellectually Challenged	85
5.3.2.4.3	Psychiatric Patients	87
5.3.2.5	The Significance Of Plant Characteristics In A Rehabilitation Environment	89
5.3.2.6	Hypothesis no. 2	90
<b>5.3.3</b>	<b>Subproblem 3</b>	<b>90</b>
5.3.3.1	Ethical Issues	91
5.3.3.2	Identification Of Activities/Treatment Plan	92
5.3.3.3	Components Of Rendering A Horticultural Therapy Service	93
<b>5.3.4</b>	<b>Subproblem 4</b>	<b>94</b>
5.3.4.1	Business Plan	95
5.3.4.1.1	Executive Summary	95
5.3.4.1.1.1	Business Concept	95
5.3.4.1.1.2	Why The Need For This Service?	95
5.3.4.1.1.3	Key Factors	96
5.3.4.1.1.4	Vision Statement	97
5.3.4.1.2	Market Analysis	98
5.3.4.1.2.1	The Overall Market	98
5.3.4.1.2.2	Competing Therapies	98
5.3.4.1.2.3	Associated Therapies	99
5.3.4.1.2.4	Target Market And Customers	99
5.3.4.1.2.5	Focused Setting	100

5.3.4.1.2.6	Service Recipients	100
5.3.4.1.2.7	Advertisement	101
5.3.4.1.3	Financial Position And Forecast	101
5.3.4.1.3.1	Existing Finance, Sponsorship and Loan Applications	102
5.3.4.1.3.2	Income	102
5.3.4.1.4	Staff Complement	104
<b>6.</b>	<b>RECOMMENDATIONS</b>	<b>106</b>
6.1	Introduction	106
6.2	Essential Considerations For Future Programmes	106
6.2.1	Initial Planning	106
6.2.2	Appropriate Selection Of Participants And Activities	107
6.2.3	Facility Considerations	109
6.2.4	Assessment Procedure	109
6.2.5	Enhancement Of Design Qualities	110
6.2.6	Problem Areas	110
6.2.7	Future Training	110
6.2.7.1	Proposed Course Outline	111
<b>7.</b>	<b>CONCLUSION</b>	<b>113</b>
	<b>BIBLIOGRAPHY</b>	<b>116</b>
	<b>APPENDICES</b>	
	<b>Appendix A:</b>	
	Appendix A 1	124
	Appendix A 2	126
	<b>Appendix B:</b>	
	Appendix B1	127
	Appendix B2	130

Appendix B3	133
Appendix B4	146
Appendix B5	138
Appendix B6	140

### **LIST OF FIGURES**

<b>Figure 3.1</b>	Activity Effectiveness Evaluation (AEE)	36
<b>Figure 3.2</b>	Horticulture Therapy Pretest Questionnaire	39
<b>Figure 5.1</b>	Participants fee structure	102
<b>Figure 5.2</b>	Abridge forecasted income statement	103
<b>Figure 5.3</b>	Staff complement	104

### **LIST OF TABLES**

<b>Table 4.1</b>	Description of criteria	47
<b>Table 4.2</b>	Grading of Horticultural Activities	48

### **RESULTS:**

<b>Table 5.1</b>	Patients by group	63
<b>Table 5.2</b>	Is patient interested in gardening?	63
<b>Table 5.3</b>	Has patient incorporated gardening as a part of leisure activities in the past?	64
<b>Table 5.4</b>	Does the patient talk with the therapist?	64
<b>Table 5.5</b>	Does the patient talk with other members of the ward?	65
<b>Table 5.6</b>	Does the patient care for the work environment?	65
<b>Table 5.7</b>	Patient group response for each subsection of the HTPQ	66
<b>Table 5.8</b>	Patient group response for each activity	68
<b>Table 5.9</b>	Levels of task accomplishment for various subsections for each activity, indicating the response of each category of patient.	75

## LIST OF CHARTS

<b>Chart 5.1</b>	Patient group response to activities 1 to 10	69
<b>Chart 5.2</b>	Patient response to subsection Avocational/Educational	76
<b>Chart 5.3</b>	Patient response to subsection interpersonal/social	79
<b>Chart 5.4</b>	Patient response to subsection responsibility	82
<b>Chart 5.5</b>	Individual patient response within each category: Forensic patients	84
<b>Chart 5.6</b>	Individual patient response within each category: Intellectually challenged	85
<b>Chart 5.7</b>	Individual patient response within each category: Psychiatric	87

# **1. INTRODUCTION**

## **1.1 Historical Overview**

The first recorded use of horticulture as a treatment occurred in ancient Egypt when court physicians prescribed walks in palace gardens for royalty who were mentally disturbed and ill. The cultivation and maintenance of natural elements in urban environments is an ancient practice. Environmental elements (trees, green grass and other vegetation) were valued by the Greeks and Romans as aesthetic buffers to crowded city scenes (Thacker, 1985). It was not until the late 18<sup>th</sup> century and the early 19<sup>th</sup> century, in clinical settings in the United States, England, and Spain, that the understanding of people-plant connections began to evolve into an accepted treatment (Davis, 1998). Research suggested that horticultural pursuits have provided beneficial results. According to Parsons, Ulrich, and Tassinary (1994), the development of an accurate knowledge of how people responded to plants should be of prime concern to horticulturalists. Without knowledge of how people responded to different horticultural stimuli, it would be impossible to assess the full range of potential healing benefits associated with this (Parsons et al., 1994). A study conducted by Patel (1994) described how gardening influenced and promoted the use of various sources and channels of communication and thereby improved communication between participants and horticultural service providers.

## **1.2 Universal Importance Of Horticulture As A Therapy**

In North America and Europe, an increasing number of rehabilitation programmes for adults are being implemented, and have become an integral part of the service continuum provided to the population. Rehabilitation focuses on the treatment of disability and the restoration of an individual's capability to live life to its full potential (Demers, Ska, Desrosiers, Alix, Wolfson, 2003). In response to this, healthcare centers universally work with plants to provide a powerful form of therapy for patients

with emotional and mental disabilities. Horticulture is integrated into the mental healthcare system and horticultural therapists work in a wide array of settings, from nursing homes to prisons, schools and hospitals.

The objective is always to ease mental and physical disabilities and provide creative, recreational and vocational activities for people who often have very few such outlets.

### **1.3 Importance Of Horticulture As A Therapy In South Africa**

The transition from apartheid rule to a new democracy in South Africa has been accompanied by the vision of a national health care system based on the principles of universal primary health care. South Africa has made great strides towards the implementation of a national health system which increases access to community-based health services. South Africa's multicultural society, requires that the health care system accommodates a multiple cultural formation of treatment modalities. This is visible through legislation making provision for free health care; the development of health districts; as well as the building of primary health care clinics. The mental health-care system is therefore in a state of change. The new approach must provide for a broad vision of comprehensive integrated primary mental health care for South Africa. (Petersen, 2000)

Locally, hospitals are finding the need to provide more thorough rapid treatment with less resources. Lengths of stay of patients have been reduced and the need to provide effective treatment quickly has increased (Straus, 1994). The majority of residents of nursing homes and health care facilities spend their time in their rooms, doing little or nothing, inactive, immobile, and alone (Ice, 2002). How can health care facilities then promote and support social interaction in a meaningful manner?

In an unpublished survey by J October (1998), conducted in a questionnaire format, responses from twelve healthcare institutions in the Western Cape, South Africa were received. The objective of the survey was to ascertain whether horticulture activities could be introduced into a hospital environment. The results of the survey showed that there was a need for horticultural therapy involving patients, healthcare workers and plants. The present study was commenced with the notion of fulfilling



the recommendations of the survey results i.e. to design horticulture activities to be tested in a pilot project for the development of a Horticultural Therapy Model to be utilized by a horticulturist interacting with a health worker at a healthcare institution. Further to this, it is hoped that the model will be adopted as a guiding framework for understanding and upholding the principles of horticultural therapy in a wider array of settings.

As a result of insufficient healthcare resources, gardening activities had been introduced at healthcare institution as a means to improve recreational interest for selected patients. Although patients had been engaged in garden activities, they had not been evaluated in order to ascertain whether any specific horticultural activities had benefited them. Thus any benefits patients received from plants have been anecdotal, and therefore raise the question: "Is the implied effect due to plants or other factors"?

In terms of its setting, the chosen healthcare institution is situated on the fringes of Mitchell's Plain and Phillipi, Cape Town's lowest income communities. These communities lack an effective social support structure to deal with socio-economic problems such as unemployment and poor healthcare rehabilitation. Consequently, healthcare treatment centers and communities can benefit from the services rendered by professionals, including horticulturists. In addition, a radical new law in South Africa is about to make psychiatric help available to rural communities. The Mental Health Act of 1973 – which had the effect of keeping both patients and information behind locked doors, is expected to change. The Mental Health Care Act of 2002 is expected to come into effect within the next few months. The new law is very patient rights orientated and it emphasizes community care. The new Act will make provisions for mentally-ill persons to be employed under the Employment Equity Act, because of its provisions that no one may discriminate against a person because of mental ill-health. The legislation represents a reversal of psychiatric policies that dated back to the apartheid era, which allowed for segregation and neglect of black patients. The new law would have the effect of confining as few people as possible to psychiatric wards and putting many more mentally ill people back into society. In view of the new law, and in terms of the social problems experienced locally, employment readiness must become the desired objective of a

locally based horticultural therapy programme. Future programmes must focus on preparing work skills within the participant (Philips, 2004).

On a local front, it is envisaged that the results of the research project will reveal the benefits of horticultural activities to marginalized (disabled) population groups. It is hoped that the results bear testimony to the professional services rendered by trained health workers and horticulturists. The research project will hopefully provide the experience required to position Peninsula Technikon as a regional center for services and training of future horticultural therapist. The report will highlight positive and negative aspects, and is aimed at helping to establish and sustain a quality programme for local requirements.

The proposed research introduced horticulture activities, which were tested in a pilot project. It was the intention that the proposed gardening activities would achieve the following goals in meeting patients:

- Develop/improve educational interest of the patient;
- Develop/improve the ability of the patient to co-operate with others (Interpersonal and social);
- Develop/improve the ability of the patient to follow directions and take the initiative (Responsibility).

## **1.4 Objective Of The Study**

### **1.4.1 Statement of the Problem**

The data gathered is presented in terms of the problem:

To determine how patients at a healthcare institution respond upon exposure to various horticulture activities in order to identify activities appropriate for inclusion and design in a horticultural therapy programme.

The researcher has gathered information, which corresponds to a particular section of the problem. The sectionalization of the problem is expressed in the form of appropriate subproblems in order to facilitate management of the problem as a

whole. A brief overview of the areas of investigation can be categorized into the following:

The first subproblem is to determine if the response of different category of patients to specific horticulture activities differ, in order to select the appropriate activity for each category.

The second subproblem is to evaluate the degree of efficacy of the different horticulture activities on each category of patients, in order to determine the relative importance of each activity in the programme in meeting the patients needs.

The third subproblem integrates the result of the above subproblems in order to design a horticultural therapy model.

The fourth subproblem is to identify factors necessary for the design of a business plan for a horticulturist to engage in a horticultural therapy programme under local conditions.

A function of the ongoing investigation will be to inspect and interpret the data, which will help in the solution of the problem being researched. In order to facilitate for the achievement of the ultimate goal, it is imperative to pursuit the data in the form of the hypothesis. The hypothesis is restricted to a research problem orientated hypothesis, and not to a statistically orientated hypothesis.

The hypothesis therefore exists as a tentative guess about the outcome of the subproblems issuing from it.

The first hypothesis is that different categories of patients will not respond equally to the different types of horticulture activities.

The second hypothesis is that each category, of patients will respond better to certain horticulture activities than to others according to specific therapeutic needs.

## 1.4.2 The Setting Of The Problem

The Delimitations of the problem:

The study will only include patients admitted to Lentegeur Psychiatric Hospital. It excludes the involvement of patients from other State healthcare institutions

The study will select patients based on their deficiencies rather than the clinical diagnosis and medical history. This implies that if patients have been diagnosed manic depressive, they will not be selected on that basis but may be selected on the basis that they may not want to communicate with clinical staff and other patients.

The study will select patients from the following categories: Psychiatric disabled, forensic patients and intellectually challenged patients. The study will therefore exclude patients who have been admitted for other forms of clinical treatments.

Only four patients from each of the categories mentioned above will participate in the research: A total of twelve participants will therefore engage in the research.

The horticultural activities will include the following: propagation of indigenous plant material using rooted cuttings and seedlings, cultivation of medicinal plants, herbs and vegetable plants.

Patients will engage in planting up containers and beautifying of identified open areas within the confines of the wards at the hospital.

The definition of terms:

In order to evaluate the research, it is imperative to explicitly know the meaning of terms:

Horticulturist: A person who has been trained in various techniques of plant propagation and plant care. This training will include the art of garden design.

Horticultural therapy: Plant related activities assisting in the development of the well-being of a person. These activities assist in achieving the occupational, physical, psychological and educational development of the patient:

Horticultural activities: Activities and tasks, which involve working with plants and basic garden implements.

Participants: At Lentegour Psychiatric Hospital this refers to a patient who has been admitted for clinical treatment and partakes in a horticultural therapy programme.

Healthcare worker: A person who is trained to help someone recover from a form of illness. For horticultural therapy this will include an occupational therapist, social worker, psychologist, doctor, and nurse.

Patient deficiency/deficit: The patient/participant lacking a recognized ability/skill such as being able to interact with a group, unable to read, write and communicate.

Patient category: Patients who are Psychiatric, Forensic and Intellectually Challenged.

The assumptions:

In the hope of preventing any misunderstanding or to avoid taking matters for granted, the following assumptions may have a material bearing upon the problem:

The first assumption is that appropriate information, such as progress notes and care plans related to the patient's deficit, will be obtained via an interview with the hospital staff.

The second assumption is that healthcare personnel will monitor the patient on their return to their wards to ascertain whether there has been any change in the condition of the patient

## **2. REVIEW OF RELATED LITERATURE**

### **2.1 Introduction**

In order to answer the research questions the literature review will review certain areas of study: The researcher has attempted to indicate how these areas are connected to the research question and to each other by means of transition statements in between and after each section. The following primary source areas had been reviewed:

The evolution of horticultural therapy and how this forms the foundation of the profession, Landscape elements relating to emotions and moods, Design considerations for the development of therapeutic gardens, Understanding the environmental cues when designing gardens for emotional restoration, Components of a horticultural therapy service offered by public gardens in the United States, The role of horticulture in human well-being, Psychological principles applied in horticultural therapy, Developing a comprehensive horticultural therapy programme in a challenging environment, Standards of practice essential for a quality horticultural therapy service, Components of rendering a horticultural therapy service, and Establishing the correct project research fundamentals.

### **2.2 The Evolution Of Horticultural Therapy – A Historical Perspective.**

Although horticultural therapy is a comparatively young profession, the concepts upon which the profession is built are ancient. The first recorded use of horticulture in a treatment context occurred in ancient Egypt, when court physicians prescribed walks in palace gardens for royalty who were mentally disturbed. It was understood by these court physicians that the peaceful, non-threatening environment of the garden had a quieting effect on people. This realization did not progress to a greater level of use for a number of centuries. It was not until the late 1700s and the early 1800s, in clinical settings in the United States, England, and Spain, when the understanding of people-plant connection began to evolve into something greater – an accepted approach to treatment. (Simson and Straus, 1998)

Dr. Benjamin Rush, a psychiatrist and a professor at the Institute of Medicine and Clinical Practice in Philadelphia, initiated the active use of horticulture in the treatment of mental illness. He found that there were curative effects on mentally ill field labour, who were in a farm setting.

In 1806, hospital staff in Spain began emphasizing the use of agricultural and horticultural activities in their programming for patients with mental disabilities. The favorable evidence encouraged other institutions to realize the benefits of working with the soil for people with mental disabilities. (Simson and Straus, 1998).

It has been said by Aristotle, one of the greatest Greek philosophers of our times, that "fire, earth, air and water" are the four basic elements of life. Gardening deals with three of these elements: earth, air and water. (Kaplan, 1994)

### **2.3 Cultivating The Concept: The 'Therapeutic Landscape'.**

Studies in landscape perception and environmental psychology had argued that the relationship between humans and the natural environment is evolutionary. Individual feelings and cognitions related to preferences for environments provided features of either 'prospect (having an overall grand view of the landscape, with potential for discovering resources) or 'refuge' (offering a place to hide from danger or threats). (Mealey & Theis, 1995).

Mealey and Theis argued that landscape preferences would relate to emotions and mood. Meinig (1979), wrote of the relational link between landscape and humankind, and emphasized the individuality of this relationship, where textures, sights, sounds and smells created a subtly unique 'feel' to places that are of immense importance to life. As Tuan (1979) stated, 'landscape is a construct of the mind and feeling and as such, we respond in automatic and subconscious ways. These perceptions of previous researchers insists that our individual lives are affected in myriad ways by particular places in which we lived, linking our individual souls and psyches to the wider world. The connection between landscapes and moods (Mealey and Theis), and, the ability plant characteristics/features have to remind a person of places of

importance (Meinig), are factors which will contribute towards the selection of certain plant materials and activities for this study. The initial process of participant selection will reveal the origins of the participants. On this basis preferences will be given to link/associate origin with the plant materials and gardening activities familiar to this origin, which the participant can relate with.

Of particular importance to this study was the work done by Gesler (1992, 1993) on the notion of 'therapeutic landscapes'. Gesler suggested that certain environments promoted mental and physical well-being and that these landscapes are not necessarily 'natural' but can be created. Gesler's concept implied that specific landscapes not only provided an identity, satisfying a human need for roots, but these landscapes served as a location for social networks, and provided settings for therapeutic activities. It is therefore implied that the concept of the 'therapeutic landscape' addresses the issues of holistic, socio-ecological health that focuses on interactions that include the physical, mental, emotional, spiritual, societal and environmental factors. (Williams, 1998). The study will apply certain principles as outlined by Gesler. Participants will become involved in very basic landscape creation activities which, will be located outdoors in hospital courtyard. Besides the actual activity, it is anticipated that the outdoor environmental circumstances will have a positive effect on participants. The activities, will be designed to encourage physical and mental application. Activities of this nature will ascertain whether participants developed interpersonal/social skills.

## **2.4 Design Considerations For The Development Of Therapeutic Gardens**

*This study illustrated that design was more than simply the arrangement and manipulation of elements. It indicated that there are significant technical criteria (guidelines/considerations) that must be established for every site, participant, and programme. David Kamp (1996) explored the importance of the technical criteria required for the planning and design of a horticultural therapy programme. The study identified concepts, new ideas, and helped refined the requirements for a horticultural therapy programme. Kamp emphasized that design considerations must be balanced with technical criteria.*



This was achieved by considering the following:

- Site i.e. Garden location?
- Participants: Who would be using it?
- Goals and programme: What needs to be accomplished, and how will it be done?
- Budget: What funds are available?

Kamp outlined recommendations intended to enhance the design qualities of programmes. Specific design principles were identified, which included the following:

- Site analysis.
- Diversity in site design.
- Accessibility and ease of use.
- Diversity of plant material.
- Quality of maintenance.

These recommendations emphasized that the assessment and selection of a site is a critical step in the design process of a programme. In addition to the specific designed principles, as mentioned above, it is further emphasized that the following must be included in a site analysis:

- Site history i.e. Information related to the sites past use or condition?
- Site surrounds i.e. Information pertaining to the surrounding area.
- Site topography i.e. The nature of the terrain.
- Climate i.e. Having a knowledgeable background about the weather, prevailing breezes, and the gardens microclimate.
- Orientation and views i.e. The importance of the view seen from the different parts of the garden.
- Existing site features i.e. Are there any notable existing features on the site to consider and possible to be retained or removed.
- Soil conditions i.e. The quality of the existing soil conditions and will it be able to provide for successful plant growth.
- Site pollutants i.e. Are there any smells or noise that may influence/affect the participants or activities.

- Utility services i.e. where are services located and are there any plans for future installation of services?

Kamp further highlighted the importance of diversity in site design by considering the following design qualities, which offered aesthetic, sensorial, and functional variety and interest.

- General ambiance i.e. Provide a setting that is both benign and supportive.
- Passive use i.e. Garden provided opportunities for restful pleasures of garden setting.
- Active use: The garden being able to provide for opportunities of active participation, and in doing so accommodate a range of interest and changing abilities.
- Features of interest i.e. Consider features that draw interest and provide orientation.

Kamp provided important guidelines regarding specific technical requirements for accessibility and ease of use for an outdoor environment. He illustrated how the following must be integrated into the design:

- Gardens must be easy to enter, move through and exit. It must have surfaces and gradients that allow for safe and free movement, and be barrier-free.

Kamp demonstrated how critical plant selection is in the overall composition of the design. Considerations in plant selection included the following:

- Structure: Consideration must be given to plant materials that complement and accentuate the garden's basic structure, including screening, shelter, shade, and the definition of spaces and displays.
- Sensorial interest: The designer must have considered the value of every season and ensure that displays and interest are provided throughout the year.
- Materials for hobbies and interests: Selection of materials, which will extend interest through various seasons, such as for indoor displays, decorations, and hobbies, which included flowers, leaves, fruits, vegetables, and herbs.

The incorporation of plant material that attract wildlife to gardens can be an advantage for an outdoor environment.

In this study, the relevance of safety is recognized, and aspects related to hazardous materials and conditions were taken into account.

The recognition of safety included: Careful consideration for plants that are poisonous, thorny, or scratchy, cause allergies or itchiness, or produce messy or slippery droppings of sap, pods, fruits, or leaves. Maintenance considerations had to be incorporated into the design process from the beginning.

Included in Kamp's recognition of guidelines, it was indicated that gardens had to be attractive, safe, and functional if properly maintained. The horticultural therapy programme/project budget made provision for staff, training, supplies, equipment, and plant material replacement as part of the maintenance requirements.

The planning stage of this research project applied certain criteria as outlined in Kamp's study. The project identified significant technical criteria (guidelines/considerations) that should be established for the site, participant, and programme. The following factors were considered prior to the project commencing: Project location. i.e. Would it be beneficial to have the activities indoor or outdoors, and if so how would the chosen locations physical environment impact on the participants interaction. Project facilitators carefully considered location specifics, since being outdoors (exposed to sunlight) could have significant effects on patients who are taking chronic medication. AIDS patients may be sensitive to light and may have lost the use of several senses. Furthermore patients who are receiving radiation treatment may be sensitive to any strong smells. (Mara Eckerling, 1996). The factor regarding accessibility of the site for all participants influenced final selection of the site. The venue must be easy to find. Example: Alzheimer's patients may experience difficulty in finding their way and experience memory loss, and as the illness progresses memory loss will deteriorate (Mara Eckerling, 1996). It's important that the research coordinators critically consider physical barriers that may make it difficult or dangerous for participants accessing the chosen location. Project facilitators gave special attention to doorway width leading into the workshop venue, outside surfaces, were smooth, an added advantage was that the venue had

windows, as this will allowed for views into or out of the workshop venue. Although views were important, the site allowed for some privacy, especially privacy of the patient, where it should not be encouraged for patients to be viewed by hospital visitors. The chosen site must have the potential to provide passive relaxation, rest and serenity for hospital inhabitants, and be able to accommodate for a range of patient interests, which may include planting, watering, weeding, and soil cultivation. Budget requirements were determined by the amount of participants and the nature of the designed activities. It was anticipated that the majority of the funds be sourced from a donor.

Mara Eckerling (1996) represented a range of guidelines for designing healing gardens. This study maintained the perspective that the design of healing gardens are not very different from other gardens, and it is argued that any outdoor space enhances healing. However it is acknowledged that there are certain shortcomings in healing gardens, which is associated with the qualities of a healing garden. These shortcomings are addressed in a manner, which provided a systematic/methodology, which involved organizing the design process into layers.

Layer 1 highlighted the importance regarding space and how this will make the design unique, make the person feel less stressed, and that can aid the healing process. Layer 2 outlined the physical, and practical side of designing a healing garden. It involved the usability of the garden i.e. who will be using the garden. The following were considered as examples: AIDS patients may be sensitive to light and may have lost the use of several senses. Furthermore patients who are receiving radiation treatment may be sensitive to any strong smells.

The importance regarding design criteria such as privacy of patients, mobility of patients, and physical access, as outlined by Kamp, has been reiterated in a study conducted by Mara Eckerling. Pertinent requirements for visitors included visitors needing private spaces for visits in particularly when patients are visited by large groups. Another requirement highlighted is that staff areas needed to be visually separated from the patients and visitor areas. It was noted in the requirements for patients that outdoor spaces needed to be self-advertised by being visible from inside the building for patients to observe.

Privacy of patients was further enhanced by the incorporation of screening in the form of layers of plant material or structures between the windows and the people in the garden. The design criteria made provision for staff, allowing staff to be able to monitor the area and patients with ease. This involved provision of lighting to increase usability of the outdoor spaces at night for both patients and staff. Accessibility and mobility of patients was taken into account during this study. The less mobile patients were located closest to the garden with ablution facilities within close proximity, and doors leading into garden areas being able to open and close with ease.

Physical access was provided for patients to maneuver with wheel chairs and other walking aids. In order for this to be possible pathways had to be wide enough, non-slip, and with handrails. Raised planting beds were incorporated to make access to planted areas easier. Practicality and usability for both patient and plants were enhanced by selecting areas, which had a balance of shade, sun, and wind protection. Layer 3 involved the senses of sight, sound, smell, touch, and taste. The study provided a systematic approach of dealing with each of the senses. To promote visual attractions, spaces were planted with a variety with various textures and shapes. Sounds were introduced by utilizing water (fountains and fish), wind (wind chimes), birds, vegetation, and people. Research has proven that certain scents can be stimulating, refreshing, anti-depressing, and relaxing. Stimulating, refreshing, and a relaxing atmosphere was introduced using basil, cypress, peppermint, lavender, lemon scents, scented geraniums, rose, pine, juniper, chamomile, cedar, sage, peppermint, rosemary, tarragon, sage, thyme, marjoram, The introduction of scented plants were tailored to the people using the garden.

Flowers with petals, seedpods, leaves, and bark provided for tactile experiences. Non-plant material included brick, stone, metal, and timber. The study puts emphasis on plants, which are non-edible, and must also be nontoxic. This study promotes a holistic experience about outdoor space and ultimately encourages staff and visitors to use the space for contemplative purposes.

For research purposes, the designed horticultural activities will utilize plant material, which have distinctive petals, seedpods, leaves, and bark characteristics.

Plant chosen will be non-edible and nontoxic. It is hoped that with these distinctive characteristics plant will be able to provide some tactile experiences for participants.

## **2.5 Understanding The Environmental Cues When Designing Gardens For Emotional Restoration.**

Marni Barnes (1996) research elucidated the connection between emotional restoration and the environmental settings. The research principle has been *specifically chosen by individuals to assist in their healing process*. The study revealed that emotional healing is a complex process and that each individual has a range of needs and, over time, moves through a series of phases. The phases are described as part of an outdoor setting and have a strong correlation with the components of a meditative process, as outlined by Dr. Herbert Benson.

The recognition of these phases, and the relationship between these phases, the environment, and emotional healing, makes these phases concrete design considerations, flexible and adaptable for most horticultural therapy programmes.

These phases are described in the context of a realistic garden/outdoor environment and the capabilities of these phases are demonstrated on the basis of movement, focal points, changes, and sensory awareness.

The first phase, The Journey: Examples of the application of this design principle are: Creating movement by having a series of focal points to draw attention into space. Introducing variety in scale to create a sequence of outdoor rooms. Demonstrating new perspectives by introducing changes in elevation resulting in expansive views. Replicating transition and a sense of "leaving behind" by utilizing bridges in a design. Emphasizing the distant traveled by limiting the view back along a path.

The second phase, Sensory Awareness, involved awareness to external stimuli. Examples illustrating this principle included the following: Fragrant foliage underfoot and scented blooms planted along pathways and near seating areas for olfactory

stimulation. Visual interest were created by using pleasing combinations of colour and textures.

The study conducted by Barnes provided practical techniques of how to stimulate the tactile perception within a garden setting. It recommended the creation of a micro-climate by introducing areas of overhead shade and reflected heat. For stimulating the taste buds, plants that are edible for humans and animals were introduced. Sounds, and particularly soft sounds, were introduced by integrating *running water or wind chimes into the design.*

Self-awareness, which formed the basis for the third phase, focused on providing a safe haven for self-reflection opportunities in a ward environment. It ultimately promoted safe seclusion and esteem building of the individual. Examples illustrating this principle included the following: Creating security, which was derived from orientation by incorporating benches with a backdrop that allowed the individual the opportunity to visually scan the surroundings. Seating around the perimeter of a space, which provided safety that came from being part of a group. Allowing for the feeling of insulation from others by including a fountain with “noise”.

The study portrayed the importance of solitary enhancement. This was achieved by the application of activities that were visually defensible yet private. It was made possible by the careful selection of trees to climb or a pond with small islands or secluded peninsulas.

Spiritual Awareness encompassed the ideas related to the fourth phase. The design principle for this phase was based on connectedness between majesty and mystery of the site and its surrounds. To demonstrate the passage of time a human scale sundial was used to illustrate this experience. The cycle of life, death, and decay was a realistic experience, enhanced by the incorporation of a variety of seasonal plantings. Nectar producing plants was selected to attract birds and butterflies.

## **2.6 Horticultural Therapy Services Offered By Public Gardens In The United States**

In certain countries, in particular the more developed countries such as the United States of America, there are public gardens that offer community outreach services to a variety of healthcare institutions. These public gardens employ a qualified horticultural therapist or a horticulturist to coordinate the project. The service rendered by the garden is on a contract basis. The public garden is financially remunerated for services rendered. The following are examples of the diversity of projects/programmes offered: Indoor Horticultural Therapy Projects: Growing windowsill herbs, kitchen gardening, learning to take plant cuttings, planting bulbs for indoor bloom, and planting seeds for the outdoor garden. Outdoor Horticultural Therapy Projects: Preparing a garden site, vegetable gardening, weeding, watering, pruning, planting a tree, growing herbs, planting a pizza garden, building a compost pile, and taking cuttings of annuals. (Simson and Straus, 1998)

The priority of the research project is to assess how certain participants respond to selected plant activities. An additional outcome of the research project will be to identify factors necessary for the design of a business plan for a horticulturist to engage in a horticultural therapy programme under local conditions. Based on the model used in developing countries such as the United States of America, it is envisaged that a horticultural therapy service under local condition will be rendered on a contract bases, where the institute represented by the horticulturist is financially remunerated. The nature of programmes offered to clients will be diverse in it's make-up and will be geared for indoors as well as the outdoors. To provide for variation and diversification it is intended that programmes offered for local requirements will be cost effective and offer activities such as: plant cuttings, planting seeds in garden site, vegetable gardening, and weeding, watering

## **2.7 How Horticultural Therapy Relates To Human Beings.**

The role of horticulture in human well-being is further emphasized by Relf (1999). Her study illustrated how plants impact on the human environment, and as a result



of this connectedness, humans have a physical dependency on plants. A study conducted by Stamm and Barber (1999), underlined the importance of horticulture and how it is interrelated with the aspects of life. The interrelationship between horticulture, and the general aspects of human life, is further illustrated in a study conducted by Barnes (1996). This study used horticultural therapy to describe the life cycle of plants and signified the cycle of life, death, and decay. In this study horticulture provided a meaningful emotional connection for humans. Stamm and Barber (1999) acknowledged that patients who have received horticultural therapy have found this form of therapy (i.e. the connection between human life and plant cycles) to be the most significant treatment during their stay in hospital.

## **2.8 Psychological Principles Applied In Horticultural Therapy.**

In a study conducted by Schwebel (1993) it was illustrated that a horticultural therapist applied several psychological concepts, theories, and techniques in order to help their clients overcome personal circumstances. The horticultural therapist employed two principal tools. They used themselves as caring, concerned, and knowledgeable individuals, and they extensively made use of plants and plant materials. The study involved four individuals who were receiving assistance in their quest for personal adjustment.

For literature review purpose and in the interest of this research project, the researcher will focus on two cases. In the first case the horticultural therapist (Alice) developed an insight into the client (Mrs. Smith) by engaging Mrs. Smith into conversation. The discussion with Mrs. Smith was directed towards relevant issues. *Alice attentively listened to her client. She applied her perspective and had to on numerous occasions view the world through Mrs. Smith's eyes in order to understand what her client had experienced.* During the programme, the horticultural therapist engaged her client on topics that focused on the following: The client's current and past activities, what she enjoyed, and her hopes for the future. This helped the client to finally explicitly state her concerns. This allowed the horticultural therapist to discuss the responsibilities her client could assume in the programme. This encouraged Mrs. Smith to develop a psychological sense of ownership of the

jobs she assumed, meaning that she would act towards her tasks with pride seen in owners of small businesses.

In the second case the horticultural therapist (Angela) helped her client (John), age 8, develop social skills and vocational abilities that helped him to be self-supporting. When John arrived at the greenhouse, Angela greeted her client with an ice-breaker, which involved watering of a wilted plant and immediately witnessing the results. Secondly, the horticultural therapist showed her client a comic-book-style workbook that was used to learn about plants and "The Plant Computer". Angela explained to her client how this has helped many school children learn about plants. Angela organized the learning material into small learning steps. This made learning easier and provided the instructor with opportunities to give her client positive feedback. John's correct work was reinforced with visual treats like fireworks, rainbows, and waterfalls. Angela taught her client that caring for plants, attentively and in a responsible manner, and that thoughtful planning, energetic work, and persistence, would bring him results he desired. The therapist explained to her client that this was *a lesson that could be applied to life in many ways.*

To help achieve the objects of the research project, the facilitators and researcher will apply the approach as used by Schwebel (1993). For the research project purpose the research will therefore not solely rely on plants and plant materials as a major tool to connect the horticulturist to their clients. The horticultural therapist and facilitators, with their patience and optimism, will play a key role in promoting growth and development in their clients.

## **2.9 Developing A Comprehensive Horticultural Therapy Programme In A Challenging Environment.**

Christine Wotowiec (1998) provided a brief account of her perspectives from a project coordinated at Fairhaven School, Alexandria, Egypt. This project illustrates that the social and economic requirements of Egypt and South Africa are similar i.e. educating the people and creating work opportunities are a major requirement.

Fairhaven is a special education school, and its main mission was to serve the mentally retarded. Challenges at Fairhaven included: Lack of materials, limited budget, teachers with little or no knowledge of plant science and horticultural therapy methods, and no prior model of a functioning sheltered workshop.

Teachers and staff at the school were engaged in workshops in order to understand the concepts of horticultural therapy. Teachers received in-depth training. This training included concepts and methods of horticultural therapy, basic plant science, greenhouse culture, and instruction in developing a vocational curriculum. Teachers were also learnt how horticulture could serve as an educational motivator within the classroom. Greenhouses were built to serve as a hands-on lab for horticultural projects and a tool for enhancing motivations and skills. The greenhouse also allowed an opportunity for students to begin early training for a possible future in a horticultural career or sheltered workshop environment. Students who participated in the horticultural therapy projects showed an increased stimulation toward learning, increased concentration, and a desire to participate in future horticultural projects. Additional benefits included progress in motor control, social skills, and self-esteem

Both nations (Egypt and South Africa) are on the African continent and therefore share the following: Has a strong African culture, and a distinct historical connection with agriculture and subsequently greening activities. Both nations are dedicated to human development and training. This project attempts to create a resurgence of horticultural therapy in Egypt. This project has made Egyptians realize that horticulture can be an excellent tool for education, business, and pleasure. The research project will engage clinicians and clients in a wide array of horticultural activities. Participants will be learnt how horticulture could serve as an educational motivator within the hospital environment. A hospital ward will be organized to serve as a hands-on lab for horticultural projects/activities. This training environment will allow for an opportunity for participants to begin early training for a possible future in a horticultural career or sheltered workshop environment. It is envisaged that additional benefits from this project will include progress in motor control, social skills, and self-esteem.

## **2.10 Studies Illustrating The Benefits Of Horticultural Therapy.**

Walter and Alice Borgeest Garden at Friends Hospital, in Philadelphia, is a psychiatric hospital for patients who suffer from Alzheimer's illness or similar disorders. At the hospital garden elements created an environment, which provided for restorative feelings of healing, serenity and beauty. (Durham and Kenline,1996).

The garden design was planned in a manner in order to lessen the feelings of agitation and anxiety associated with Alzheimer disease. The general garden layout promoted a passive feeling, which encouraged relaxation and rest. The main design features included circular pathways, frequent rest areas, a gazebo for the provision of privacy, trellises covered with fragrant plant material, hospital windows overlooking landscaped areas, and aesthetic pathways. Plant types chosen for this garden included perennials such as herbs, cut flowers, and plants suitable for drying. It also included plants capable of providing sensory stimulation such as lavender, sage, thyme, oregano, and chives. Flowers chosen for drying included yarrow, lavender, grasses, and artemesia. Annual plant materials were placed in raised flower containers. An important feature of the horticultural therapy programme involved portable containers on wheels, which made gardening convenient for those patients with mental and physical limitations.

For research purpose the hospital ward will form the main venue where project session will take place. It is intended that with adequate funding the outside areas adjacent to the ward will benefit from the project activities and allow for views from inside too overlook outside landscape areas. Some plants planted for research purpose will be planted in containers and place on hospital windowsills. Plant types chosen for research purposes will include perennials such as herbs, cut flowers, and plants suitable for drying. Depending on availability, it will also include plants capable of providing sensory stimulation such as lavender, sage, thyme, oregano, and chives. Flowers chosen for drying may include yarrow, lavender, grasses, and artemesia. The ultimate objective would be to utilize plant and non-plant materials, which makes gardening easy, practical and convenient for all participants.

Keeley and Starling (1999) described the role of gardening activities at a shelter for woman and children. Participants partook in planned gardening activities such as seed planting, transplanting, weeding, watering, pruning, thinning and harvesting. This research demonstrates that horticultural therapy provided satisfaction for people of various ages and gender groups. The nature of the activities provided participants with a physical sense of satisfaction. This reiterates the benefit of horticultural therapy as founded by Relf (1999). Human quality of life is impacted by the *psychological and physiological presence of plants (Relf,1999)*. This was an important design element at the San Leandro shelter for woman and children, where design elements such as garden details at eye level and visually visible compensated for plants, which were physically accessible. The psychological and physiological benefit of horticultural therapy is further illustrated in a study done by Gray (1999) for those with dementia and physical frailties. In order to stimulate human senses plants were selected for the following types of stimulation: tactile, gustatory, olfactory, auditory and cognitive responses.

*Besides the tangible, hands-on elements of nature, Messer (1996) explains that horticultural therapy must also provide a more holistic approach and incorporate the intangible elements of nature, such as light, shadows, wind, sound, moisture and temperature.*

The presence of plants and the cultivation thereof have an impact on human social interactions and communications (Relf,1999). This is further explained in a study done by Clopton (1998), where horticultural therapy is utilized to rehabilitate patients with schizophrenia and depression.

Horticultural tasks included: greenhouse construction, writing plant labels, planting seeds, and watering duties. The dynamics of the programme lead to apparent benefits such as: increased motivation, reduced anxiety, reduced delusions, improving social skills, building self-esteem, achieving job readiness.

The human response to the act of nurturing a garden increased well being and quality of life (Relf,1999). This is substantiated in a study done by Cornille, Rohrer, Phillips and Mosier (1986) where activities associated with horticulture for substance

abuse treatment had numerous therapeutic advantages. These advantages included raising self-esteem and helping patients to act in a more self controlled manner.

Horticultural activities included the following:

- 1) Use of a greenhouse for the propagation of a variety of houseplants.
- 2) A mist propagation bed to assist patients with cuttings.
- 3) Construction of a compost pile where patients can learn the benefits of the use of compost in gardening.
- 4) Design of a community rose garden.
- 5) Layout of a community vegetable garden in order to introduce patients to the value of growing something useful and beneficial.

Mihalko and Wickley (2003) explored potential ways in which the social and physical environments can be modified to promote and support physical active living within healthcare facilities. The study outlined an approach, which emphasized a home-like environment, where a range of care services encouraged residence independence. This study attempts to identify the characteristics of assisted living and therefore presents possibilities for horticultural therapy.

The principles of horticultural therapy have previously proven to successfully integrate into the daily activity of long-term residents in a healthcare facility and ultimately promote the social and physical aspects of a health care facility environment. Based on a study by Mihalko and Wickley, participants at nursing homes spend 65.5% of their day in passive activities, conducted in a seated position. For residents residing in independent housing, and not in nursing homes, 40% of their day is spent physically inactive. The study reveals that activities designed for therapeutic goals at skilled nursing facilities often include music, art, cooking, and game-orientated components rather than physical activity. In a recent study by Singh (2002), it is suggested that regular physical activity decreases the risk for chronic disease and increases life expectancy. Older adults who are more active have less risk of functional dependency than those who are less active.

The following question therefore arises from this study "how is an active living environment promoted in a health care facility?" This question therefore addresses

one of the principle issues of horticultural therapy i.e. to encourage active physical activity within the participant and the health care environments. Based on a survey result conducted by Wasner and Rimmer (1997) the common form of nontherapeutic exercise in nursing homes was chair exercise (88.7%), followed by stretching (45.9%), and supervised walking (44.0%). Thus interventions to promote physical active living are strongly endorsed by the significant literature that addresses the issue of horticulture and health (Gallager, Mattson, 1986). Patterson and Chang (1999) focuses, in the main, on physical activity interventions, an examining their importance in reducing specific chronic or life-threatening conditions.

Lemaitre et al (1999) have looked at the role of gardening in reducing the risk of cardiovascular disease, whilst others have considered its role in reducing cholesterol levels in elderly men (Bijnen et al., 1996).

The work done by Paterson and Chang (1999) in Australia pointed to a possible casual association between physical activity, such as gardening, and reduced anxiety and depression.

Moreover, it has been suggested that in addition to promoting improvements in physical and mental well-being, gardening, as a therapeutic activity, may also provide opportunities for empowerment and increased competence, building bridges to naturally occurring supports and resources within the broader community (Myers,1998).

Physical activity is defined as bodily movement produced by skeletal muscles resulting in energy expended (Caspersen et al., 1985). Physical fitness can be considered as a set of attributes that assist exercise and performance of physical activity. A lack of physical activity has been shown to be related to several adverse health outcomes as well as functional decline in older adults (Leon et al., 1987; Fletcher et al., 1992; Blair et al.,1995).

Regular physical activity and leading physical active lifestyles have been shown to be beneficial to older adults as follows: improved strength and flexibility, balance, and other physiological measures of functional performance such as aerobic

capacity, reduction of fracture risk and general well-being have been shown to improve with physical fitness intervention (van der Bij et al, 2000)

## **2.11 Standards Of Practice Essential For A Quality Horticultural Therapy Service.**

Professional horticultural therapists are committed to providing quality programmes for their clientele. It at all times is important for a horticultural therapist to be conscious about the quality of their services rendered.

In a report compiled by Mattson, Merkle, Parrett, and Waliczek (1993) the authors propose *Standards of Practice essential for quality horticultural therapy services*. In their report it is apparent that a professional horticultural therapist is expected to exercise sound judgment and decision making, assume horticultural therapy programme and community leadership, and exemplify an administrative philosophy in congruence with the mission and goals of their workplace.

In order for this to be accomplished Mattson, et al (1993) proposed the following aspects which are fundamental for the success of any programme:

The first standard placed emphasis on the scope of general client services, which related to the following: 1) Client orientation to the physical aspects of the horticultural environment. 2) Creating multidisciplinary treatment teams for planning and implementing in order to maximize resource utilization. 3) Taking into account the clients cultural, economic, social, and educational background. 4) Providing opportunities for clients to develop and/or use their senses, and develop leadership and positions of responsibility.

General horticultural program administration is discussed in the second standard, and encompassed the following: 1) Organizational goals corresponding with programme goals (long and short-term planning), evaluation of the efficiency of the horticultural therapy programme, and to ascertain whether it relates to the organizational goals and objectives. 2) Networking, which could help solve problems



through communicating with other organizations. 3) Personnel management, which involved the compliance of a horticultural therapist with recognized personnel policies and procedures. 4) Financial aspects of the programme to be effectively planned, implemented and evaluated in accordance to the organizational goals. Financial controls must be established to ensure that the programme operations are kept within budget. 5) Public relations programs must be planned, implemented, and evaluated to enhance a positive image of the programme and its services. 6) *Activities that will facilitate for sound relationships between clients, their family, and the organization, and enhance community relations, must be planned.*

The third standard outlined the following: 1) Clients must be provided with opportunities to participate in activities utilizing physical behaviors (sensory-motor domain), mental behaviors (cognitive domain), and emotional behaviors (affective domain). 2) Clients are provided opportunities to develop relationships with their homes, communities, nature, and networking with other societies.

*Standard four discusses the importance of developing individual treatment plans, which provided a diagnostic assessment of the client abilities.*

Standard five illustrated the importance of maintaining records, which reflects the clients response to activities and whether these responses are in accordance with programme and organizational policies.

Standard six highlighted the significance of seasonal influences on horticultural activities, and mentions that activities may be dependant on the availability of *climate controlled structures.*

The seventh standard expressed the importance of ethical practices and conveys the importance of how a programme must be designed to respect the personal rights of clients and their family. It also indicated that ethical practices must comply with government guidelines.

## **2.12 Components Of Rendering A Horticultural Therapy Services**

An organization that renders a horticultural therapy service must conduct an assessment, needs, and feasibility study before commencing with the programme. (Simson and Straus, 1998) An assessment would outline the goals and objectives of the programme as well as client goals and objectives.

A *horticultural therapist assessment begins with the following:* 1) *Definition of the population group to determine the functioning level of clients as well as definition of specific programme goals.* 2) *Ascertain the documentation or evaluation that is available at the facility to chart client progress and goal achievement.* 3) *Evaluate the facility and its physical logistics and determine whether there are specific challenges to resolve.*

Simson and Straus (1998) further describe the importance of compensation for horticultural therapy service. An appropriate fee must be based on the frequency of the programme, number of clients, and materials. Horticultural therapists generally charge a fee per hour. Some facilities charge per client. All programme cost must be determined and may include preparation time, transportation, supplies, taxes, insurance and refreshments. As part of the horticultural therapy programme the budget must be clearly stated in the contract. Payment for service rendered is either up front or by reimbursement. If resources are limited for the facility, alternate methods for procuring materials must be considered, such as donations from garden centers, wholesale nurseries, and related business. Record keeping of project materials will help estimate future project needs and help determine an accurate budget for future projects.

## **2.13 Establishing The Correct Project Research Fundamentals.**

It is critical to understand the necessity for sound project research fundamentals. By understanding these necessities many variables introduced by project components can be prevented or minimized. In so doing this will facilitate for a successful horticultural therapy research environment. In a study done by Predny and Relf (1999) examples are cited of potential variables, their effects, how to avoid or

overcome these variables. The first step before implementing any research programme is to establish good communication with the administrators and staff at the facility where the research will take place. Concerns that must be discussed include the following:

1) Facilities interest and support for horticultural therapy research. Without the facilities support it would be impossible to receive approval from the clients and/or their families to conduct the research. This ensures the well-being of the participants and the continued growth of horticultural therapy. It should be a goal for the researcher to secure long-term support and interest. The facilities knowledge of research and methodology, their flexibility and adaptability in integrating into a research project, their philosophies and goals for their clients, their awareness of the constraints and requirements, the availability of space and resources.

2) The researcher must be mindful of any institutional rules that can affect how the research is designed and implemented. The nature of supplies and tools used in horticultural therapy must be clearly explained to staff and administrators. The researcher must be careful and sensitive when adjusting procedures and let this not be disruptive to the programme. Volunteer management is essential. It is best achieved by good training, communication and respect.

3) Orientation, training, and discussion of objectives is a requirement with all selected volunteers. The researcher or a chosen mediator must respect participants and volunteers, demonstrate good leadership skills, encourage interaction, initiate conversation, stimulate formation of relationships, be enthusiastic, and be able to discuss questions or concerns.

## **2.14 Summary**

The priority of the research project is to assess how certain participants respond to selected plant activities. An additional outcome of the research project will be to identify factors necessary for the design of a business plan for a horticulturist to engage in a horticultural therapy programme under local conditions.

Literature review sources indicate that for horticultural therapy purposes, gardens had to be attractive, safe, functional and properly maintained. Previous studies illustrate the importance of the horticultural therapy programme/project budget making provision for staff, training, supplies, equipment, and plant material as part of the maintenance requirements of a programme.

The planning stage of this research project will apply certain criteria as outline in the literature study. The project will have to identify significant technical criteria (guidelines/considerations) that must be established for the site, participant, and programme. The following factors will be considered prior to the project commencing: Project location. i.e. Would it be beneficial to have the activities indoor or outdoors, and if so how would the chosen locations physical environment impact on the participants interaction. Project facilitators will carefully consider location, since being outdoors (exposed to sunlight) could have significant effects on patients who are taking chronic medication. AIDS patients may be sensitive to light and may have lost the use of several senses. Furthermore patients who are receiving radiation treatment may be sensitive to any strong smells. The factor regarding accessibility of the site for all participants will influence final selection of the site. The venue must be easy to find. Example: Alzheimer's patients may experience difficulty in finding their way and experience memory loss, and as the illness progresses memory loss will deteriorate. It's important that the research coordinators critically consider physical barriers that may make it difficult or dangerous for participants accessing the chosen location. Project facilitators will pay special attention to doorway width leading into the workshop venue, outside surface, which must be smooth, an added advantage is that the venue must have windows, as this will allow for views into or out of the workshop venue. Although views are important, the site must allow for some privacy, especially privacy of the patient, where it should not be encouraged for patients to be viewed by hospital visitors. The chosen site must have the potential to provide passive relaxation, rest and serenity for hospital inhabitants, and be able to accommodate for a range of patient interests, which may include planting, watering, weeding, and soil cultivation. Budget requirements will be determined by the amount of participants and the nature of the designed activities. It is anticipated that the majority of the funds will be sourced from a donor.

For research purposes, the designed horticultural activities will utilize plant material, which have distinctive petals, seedpods, leaves, and bark characteristics. Plant chosen will be non-edible and nontoxic. It is hoped that with these distinctive characteristics plant will be able to provide some tactile experiences for participants.

The research will not solely rely on plants and plant materials as a major tool to connect the horticulturist to their clients. The horticultural therapist and facilitators, with their patience and optimism, will play a key role in promoting growth and development in their clients.

It is envisaged that a horticultural therapy service under local condition will be rendered on a contract bases, where the institute represented by the horticulturist is financially remunerated. The nature of programmes offered to clients will be diverse in its make-up and will be geared for indoors as well as the outdoors. To provide for variation and diversification it is intended that programmes offered for local requirements will be cost effective and offer activities such as: plant cuttings, *planting seeds in garden site, vegetable gardening, and weeding, watering*

### 3. RESEARCH DESIGN AND METHODOLOGY

#### 3.1 Introduction

The selection of research design and methodology was informed by the research problem and sub-problems articulated in the introductory. The following is a summary of the research objectives:

To determine how patients at a healthcare institution respond upon exposure to various horticulture activities in order to identify activities appropriate for inclusion and design in a horticultural therapy programme.

The researcher has gathered information, which corresponds to a particular section of the problem. The sectionalization of the problem is expressed in the form of appropriate subproblems in order to facilitate management of the problem as a whole. A brief overview of the areas of investigation can be categorized into the following:

The first subproblem is to determine if the response of different category of patients to specific horticulture activities differ, in order to select the appropriate activity for each category.

The second subproblem is to evaluate the degree of efficacy of the different horticulture activities on each category of patients, in order to determine the relative importance of each activity in the programme in meeting the patients needs.

The third subproblem integrates the result of the above subproblems in order to design a horticultural therapy model.

The fourth subproblem is to identify factors necessary for the design of a business plan for a horticulturist to engage in a horticultural therapy programme under local conditions.

The nature of the patient population and constraints regarding access to the population influenced the design and methodology. These are summarised in the discussion on delimitations of the research.

### **3.2 Research Design**

Babbie and Mouton (2001, pg 75-78) identify three classification principles for research designs. The first principle is between empirical and non-empirical research. The second principle distinguishes between primary and secondary data. The third distinguishes between data sources.

This study is an empirical study because it addresses a “real world” problem (Babbie and Mouton, 2001, pg 75-78) This study, as articulated in sub-problem 1 and 2, seeks to answer an empirical question.

This study also collected new data about a specific group of subjects. It is therefore a primary data design. The data collected, especially related to sub-problem 1 and 2 was numeric in nature, while data collected for sub-problem 3 and 4 was textual.

Using this classification this study can be defined as an empirical research study using primary numerical and textual data. Primary data was collected using two instruments. *These instruments are discussed in detail later in this chapter.*

The literature also distinguishes between true experimental, quasi-experimental and non-experimental designs. The following questions are used to distinguish between the 3. Firstly, were subjects randomly selected and assigned to groups?

This was not the case in this study. Secondly, were multiple groups and multiple waves of measurement used in the study? This was not the case in this study. This study can therefore be described as using a quasi-experimental research design. A

single group of patients was involved in activities, which was evaluated by way of a questionnaire.

This type of study is referred to as the “weakest” of the research designs. Given the constraints of the research and the nature of the subjects a comparison group was not identified. While this type of research design has inherent problems, it was the most appropriate for the study.

### **3.3 Methodology**

The methodology adopted was mainly quantitative. The quantitative approach is characterized by the use of numbers to describe the qualities of concepts. Babbie et al describe the quantitative approach as a “way of measuring the properties of a phenomena ... through quantitative measurement.” (2001, p49) While the quantitative approach is associated with positivist tradition it provides an important vehicle for analyzing and describing human behavior. Based on the research design and the sub problems articulated it was the most appropriate approach.

The study is also descriptive in nature. It seeks to develop a model from a range of activities that would best meet the needs of specific groups of subjects, through the careful and deliberate observation and evaluation of patients as they engage with the activities.

There are two types of research methods used commonly for horticultural therapy research:

1. *Experimentation includes setting up an experiment, running it, and collecting the data. The body of the data is entirely new and results are derived from the researcher’s project.*
2. *After – the – fact research is looking at old information, formulating questions, and drawing new information out of what has already occurred.*

The measuring instruments have been designed for experimentation research purpose. It involves setting up an experiment (patients engaged in a designed horticulture activity) and collecting the data.



Data was gathered using the Activity Effectiveness Evaluation questionnaire. The measuring instruments were used to determine the patients response to various horticultural activities in meeting patients needs in the following areas:

- Developed a horticultural skill (educational/vocational)
- Improved interpersonal skills/socialization.
- Developed a sense of responsibility.

**The Activity Effectiveness Evaluation (AEE)** questionnaire (Figure 3.1) was developed to measure the effects of the horticulture activities on participants. It is a strategic plan to address the presenting deficiency of patients as indicated on 1 and 2 scores of the HTPQ, (Figure 3.2). When designing the AEE, questions to ask were the following: What needs to be changed. How and when can it be observed and measured before an objective can be met? AEE has specific goals, which can be achieved through intervention of specific horticultural activities. Each goal has objectives. A goal in terms of the AEE is a task/activity to be achieved what the researcher hopes to accomplish in meeting patients needs. An objective is something written for each goal. These are steps taken to meet the goal(s). The goals and objectives are written in a format in which they are clear and concise, observable, and measurable format. The goals and objectives are reasonable and attainable within the time frame of each session. The goals and objectives are short-term. Short-term goals can be addressed in a short period of time, perhaps in a session or two. An objective can be met when a task has been accomplished or when a patient responds to a question. Evaluation was done on a factual account. The expected outcome of a task or activity to be included in the new programme is a score of 3 or 4 on the AEE form. Each activity and its results were reviewed, in order to evaluate how scores may differ and ultimately identify which activity obtains the best score for each group of patients. Each member of the research team had to follow the same guidelines when interacting/illustrating activities to participants. This ensured that each task/activity was approached and conveyed in a consistent manner. Research members had to comply with policies and procedures as outlined in the Letter of Consent (Appendix 3). This fulfilled the hospital and the project quality assurance requirements (Simson and Straus, 1998).

**Figure 3.1: Activity Effectiveness Evaluation (AEE)**

**Activity Effectiveness Evaluation - Patient**

**Staff:** \_\_\_\_\_

**Activity:** **General garden maintenance, which included transplanting of groundcovers into the garden area.**

**Patient:** \_\_\_\_\_

**Patient deficiency:** \_\_\_\_\_

**Date:** \_\_\_\_\_

<b>AVOCATIONAL &amp; EDUCATIONAL INTERESTS</b>				
Selects own plant material for task	1	2	3	4
Fill pot accurately with soil	1	2	3	4
Place cuttings/plant in pot accurately	1	2	3	4
Water plants accurately	1	2	3	4
Complete horticultural tasks correctly	1	2	3	4
Work with gardening tools effectively	1	2	3	4
Ask questions about cultural practices of plants	1	2	3	4
Writes own name on plant label	1	2	3	4
Writes date on label	1	2	3	4
Writes plant name on label	1	2	3	4
Able to identify plant types	1	2	3	4
<b>INTERPERSONAL/SOCIAL</b>				
Did the patient talk with other members of the group?	1	2	3	4
Did the patient talk with the facilitators and therapist?	1	2	3	4
Did the patient share tools and space?	1	2	3	4
Did the patient share their experience with others?	1	2	3	4
Did the patient enjoy working in a group?	1	2	3	4
Did the plant type chosen stimulate conversational interests?	1	2	3	4
Did the plant activity beautify and create a more relaxing hospital environment?	1	2	3	4
<b>RESPONSIBILITY</b>				
Did the patient follow directions/sequences of tasks to the end?	1	2	3	4
Did the patient cooperate with others by cleaning up after activity?	1	2	3	4
Did the patient anticipate taking plants to room/ward?	1	2	3	4
Did the patient take the initiative to water and care for plants?	1	2	3	4

**Key:**  
 (1) not at all    (2) sometimes    (3) most of the time    (4) the whole time

### **3.4 Treating The Data**

In order to analyze the population sample, data was entered using the Statistical Package for Social Science Version 11 (SPSS). Questionnaires were coded and entered into SPSS package.

The Activity Effectiveness Evaluation (AEE) was used to formulate Appendix A2, which represents data based on the content AEE. Each participant was coded using a number (1 to 12). The content of Appendix A2 outlines the method of gathering data and interpreting the collected data.

The AAE questionnaire is divided into 3 sections:

- Avocational & educational interests
- Interpersonal/social
- Responsibility

Each of these 3 can be viewed as subsections of the complete questionnaire. The scores generated for the AEE are discussed in Appendix A2, which represents data based on the content AEE.

#### **3.4.1 Demographic Variables**

Subjects were coded into 1 of 3 patient groups:

- Forensic
- Psychiatric
- Intellectually challenged

On the basis of responses in the pretest questionnaire (HTPQ) (Figure 3.2) subjects were classified in terms of their:

- Learning potential
- Social interaction
- Responsibility

These variables were used to segment the dataset for the purposes of comparison.

### 3.4.2 Sample

The population consists of patients admitted at a public (State) psychiatric institution in the Western Cape.

The sample consists of 12 patients admitted to a Psychiatric Hospital. It involved patients who were admitted for Psychiatric rehabilitation, Forensic treatment, and Intellectually challenged. The sample consisted of four patients from each of the following groups: Psychiatric, Forensic, and Intellectual.

Selection of participants (i.e. the Sample) was done using the Horticultural Therapy Pretest Questionnaire (HTPQ) (Figure 3.2). The content of the HTPQ was applied when prospective participants were interviewed to partake in the research. In order to identify and select participants, qualified clinicians and horticulturists conducted interviews with prospective participants, and on the bases of information recorded by means of the HTPQ and observations, participants were selected for the research process.

The content and results of the HTPQ relates to the content of the Activity Effectiveness Evaluation (AEE). Participants (Sample) selected for the research process had to score 1 (not at all interested in gardening) or 2 (sometimes interested in gardening) on the HTPQ. Patients with a rating of 1 or 2 on the HTPQ were considered ideal candidates for the research.

The research activity will ascertain which activities were effective in terms of the AEE, and the assumption is that once participants have been engaged in the designed activities that participants will produce scores of 3 (most of the time interested in the activity) or 4 (the whole time interested in the activity) on the AEE. Scores of 1 and 2 on the AEE will indicate that participants has not benefited. In order to identify and select participants, qualified clinicians and horticulturists conducted interviews with prospective participants.

**Figure 3.2: Horticultural Therapy Pretest Questionnaire (HTPQ)**

<b>Horticultural Therapy Pretest Questionnaire</b>
--

**Hospital staff name:** \_\_\_\_\_  
**Patient (client) name:** \_\_\_\_\_  
**Ward No.:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

**Patient group (circle the appropriate):**

**Psychiatric**                      **Intellectual**                      **Forensic**

<b>LEARNING POTENTIAL</b> (Educational interest)				
Is the patient interested in gardening?	1	2	3	4
Has the patient incorporated gardening as part of his/her leisure activities in the past?	1	2	3	4
<b>SOCIAL INTERACTION</b>				
Does the patient talk with other members in the ward?	1	2	3	4
Does the patient talk with the therapist?	1	2	3	4
<b>RESPONSIBILITY</b>				
Does the patient care for their work environment i.e. Does the patient tidy up, and organize their area?	1	2	3	4

**Key:**  
 (1) not at all    (2) sometimes                      (3) most of the time    (4) the whole time

### 3.4.2.1 Definition of the Sample

#### 3.4.2.1.1 Forensics

The word *forensics*, derived from the Latin, *forensis*, means “forum”, the place where trials were conducted in Roman times. The current use of forensics denotes a relationship between one professional field, such as medicine, pathology, chemistry, anthropology, or psychology, with the adversarial legal system. (Goldstien, 2002)

Many definitions of forensic psychology exist. The “Specialty Guidelines for Forensic Psychologists” (Committee on Ethical Guidelines for Forensic Psychologists, 1991), a set of ethical guidepost for those working in the field, defines forensic psychology as a field that covers “all forms of professional conduct when acting, with definable foreknowledge, as a psychological expert on explicitly psychological issues in direct assistance to the courts, parties to legal proceedings, correctional and forensic mental health facilities, and administrative, judicial, and legislative agencies acting in a judicial capacity”

Forensic psychology is a speciality recognized by the American Board of Professional Psychology (ABPP). ABPP (2000) defines the field in their written materials as “The application of the science and profession of law to questions and issues relating to psychology and the legal system” Heilbrun (2000) defines forensic psychology as “the professional practice by psychologists within the areas of clinical psychology, counseling psychology, neuro-psychology, and school psychology, when they are engaged regularly as experts and represent themselves as such, in an activity primarily intended to provide professional psychological expertise to the judicial system”

Goldstien (2002) considers forensic psychology to be a field that involves the application of psychological research, theory, practice, and traditional and specialized methodology (e.g., interviewing, psychological testing, forensic assessment, and forensically relevant instruments) to provide information relevant to a legal question.

The goal of forensic psychology as an area of practice is to generate products (information in the form of a report or testimony) to provide to consumers (e.g., judges, jurors, attorneys, hiring law enforcements agencies) information with which they may not otherwise be familiar to assist them in decision making related to a law or statute (administrative, civil, or criminal). As an area of research, it's goal is to design, conduct, and interpret empirical studies, the purpose of which is to investigate groups of individuals or areas of concern or relevance to the legal system.

The major role of a psychologist working in clinical setting, whether as psychotherapists or as psychological evaluators, is to help the client. What is learned about the patient is used to benefit the patient in terms of personal growth and support. However, in forensic psychology, the role of the expert is significantly different. Forensic psychologists are charged with using the results of their assessment to help or educate the court, without regard to the potential benefits to the examinee. (Goldstein, 1996). Forensic patients are referred by the court to a *psychiatric setting for psychological evaluation and/or treatment*.

#### **3.4.2.1.2 Psychiatric**

A Psychiatric patient has a mental state or condition (Psychosis) in which that person has lost touch with reality. (Nopoulos, Alessandro, Huth, 2002)

There are different types of psychosis. They include:

- ❑ Psychosis caused by drugs or alcohol
- ❑ Bipolar disorder (also known as Manic-Depression)
- ❑ Depression
- ❑ Schizophrenia
- ❑ Dementia

What causes psychosis?

- ❑ It can be caused by different conditions.
- ❑ Some cases can be caused by drugs.
- ❑ Other may be the result of the brain not functioning right.

Who can get it?

- ❑ Certain factors may place a person at higher risk for psychosis.
- ❑ A family history of psychosis can place the person at higher risk.
- ❑ Adolescents and young adults are at higher risk for having their first psychotic episode.

What are the symptoms?

- ❑ Loss of touch with reality.
- ❑ Seeing and hearing things that are not there (hallucinations).
- ❑ Thoughts that are strange and disorganized.
- ❑ Showing emotions in strange ways.
- ❑ Extreme excitement (mania)
- ❑ Confusion
- ❑ Depression
- ❑ Abnormal fear
- ❑ Changes in personality
- ❑ Believes that things are clearly not true.

What is the impact of this condition?

- ❑ The person may be scared.
- ❑ May want to isolate him or herself.
- ❑ Relationships with family and friends may change.
- ❑ Often there is a loss of trust.
- ❑ This person may be unable to work or do a job.
- ❑ This person is at high risk for substance abuse.
- ❑ At high risk for suicide.

#### **3.4.2.1.3 Intellectually Challenged**

The medical term used is "Intellectually Challenged or Intellectually Disabled". This is the new classification, which is known internationally and accepted. The old version is somewhat harsh and inappropriate (Mentally Handicapped/Retard). The new version is more uplifting to the individuals self esteem. This condition is usually the result of inadequate development of the mental capacity as opposed to physical development, and is not a mental disease. (Adhikari, 2002)



An individual is considered to have mental retardation based on the following three criteria: intellectual functioning level (IQ) is below 70-75; significant limitations exist in two or more adaptive skill areas; and the condition is present from childhood. (AAMR, 1992)

What are the causes of mental retardation?

Mental retardation can be caused by any condition, which impairs development of the brain before birth, during birth or in the childhood years. Several causes have been discovered, but in about one-third of the people affected, the cause remains unknown. The three major causes of mental retardation are Down syndrome, fetal alcohol syndrome, and fragile X chromosome (Alexander, 1998). The causes can be briefly categorized as follows:

- ❑ Genetic conditions.
- ❑ Problems during pregnancy
- ❑ Problems at birth
- ❑ Problems after birth
- ❑ Poverty and cultural deprivation

How does mental retardation affect individuals?

The affects of mental retardation vary considerably among people, just as the range of abilities varies considerably among people who do not have mental retardation. About 87 percent will be mildly affected and will be a little slower than average in learning new information and skills. As children, their mental retardation is not readily apparent and may not be identified until they enter school (Batshaw, 1997). As adults, many will be able to lead independent lives in the community and will no longer be viewed as *having mental retardation*. The remaining 13 percent of people with mental retardation, those with IQ's below 50, will have serious limitations in functioning. However, with early intervention, a functional education and appropriate supports as an adult, all can lead satisfying lives in the community.

## **4. DESIGNED HORTICULTURE ACTIVITIES AND ITS IMPLEMENTATION**

The AEE questionnaire was applied by the research team to 10 horticulture activities. Many successful horticulture therapy (HT) programmes utilize and emphasize indoor spaces and activities such as craft projects, floral design, and plant propagation to provide rewarding and effective therapeutic experiences. A greenhouse is not mandatory for successful programming. Many programmes need to start small (Simson and Straus, 1998). The designed horticulture activities therefore centers around plant propagation and cultivation. The activities have been developed by the research team to address the patient's deficiency in order to measure appropriately whether there has been an improvement in the patients abilities. The horticultural equipment and material recommended for each activity has been selected to encourage growth in the patient and not to set the patient up for failure and undermine therapeutic gains. It was chosen to suit each individual lifestyle and the hospital's resources. The level/standard of activity was enough to challenge but not strain or frustrate the patient. Activities were geared to develop learning skills, social skills and responsibility. The HT group met in a room utilized for therapeutic recreation.

Patients were engaged in designed horticulture activities. Each of the activities had specified goals and outcomes as reflected in the AEE (Figure 3.1), which are aimed at the patient's deficits. The following patient deficit had been recorded in the Pretest Questionnaire (Figure 3.2) and is applicable for each patient:

- Patient has no or some interest in gardening activities (Learning potential/educational interest).
- Patient does not or sometimes talk with other members and therapist in the ward (Social interaction).

- Patient does not or sometimes care (tidy up, organize their area) for their work environment (Responsibility).

It is intended that the horticultural activities will be rated according to the accomplishment of the following therapy goals, thereby rectifying/addressing and meeting their needs.

Patients will increase their interest in gardening by completing a gardening task, thereby developing an education interest. With clinician and horticultural support patients will interact and talk with other ward members and staff thereby developing a social skill. With accomplishment of the gardening task, patients will develop a sense of responsibility towards their immediate environment.

#### **4.1. Description Of The Activities**

The designed activities were based on similar activities, which are extensively used in programmes by Public Gardens internationally. The designed activities were centered around the following activities: Growing of herbs, learning to take cuttings and planting cuttings, planting seeds for outdoor garden, preparing a garden site, vegetable gardening, weeding, watering, and planting flowering annuals (Simson & Straus, 1998). The selection of activities for this research project is further substantiated by Cornille, et al, 1986, where horticulture activities, in particular the propagation of a variety of house plants, were used to raise self-esteem of participants, suffering from substance abuse. In a study done by Kaplan, 1994, it is further emphasized that gardening must be based on earth, air, and water. The choice of plant material for this research work included plants, which have distinct textures and smells. This is substantiated in work done by Meinig (1979). Meinig outlines the importance of plants, particularly their textures and smells, and acknowledges that this has the potential to create a feel for places, which are important to the individual. Kamp (1996) suggests that in order to extend the participants interest through various season of the year, plant choice must be based on flowers, leaves, fruits, vegetables, and herbs. Plants, which presented a safety hazard to participants, were excluded from this research work. These plants were excluded on the basis that they were poisonous, thorny, scratchy, cause allergies or itchiness, produce messy or slippery dropping of sap, pods, fruits, and leaves.

**The following are the activities:**

1. A mix planting of indigenous groundcover in a container.
2. Planting a mixture of rooted vegetable cuttings
3. Sowing a mixture of vegetable seed.
4. Weeding, mulching, removal of dead plants, planting of shrubs and groundcover.
5. Planting of scented geranium cuttings to grow in a sunny position.
6. Planting of mixed herb plants into a container
7. Participants form groups of three and engage in the planting of strawberry plants.
8. Participants form groups of three and engage in the planting of flowering annuals.
9. Participants prick out herb seedlings and transplant this into large containers.
10. Participants partake in general garden maintenance, which include transplanting of groundcovers into garden area.

**4.2 Grading Of The Horticultural Activities**

The 10 activities are presented in a particular order to facilitate the development of specific skills, knowledge and ability. It also recognizes that the patient groups bring different and varying interests, skills and knowledge to the activity. This cannot be controlled in the study, except through the categorization of patient groups. Table 4.2 provides a rubric, which grades the activities according to 3 criteria. These criteria are described in Table 4.1:

**Table 4.1: Description of criteria**

<b>Each activity 1 to 10 have been classified using one of the following criteria:</b>		<b>Complexity of activity measured on a scale 1 to 5</b>
1.	Manual 1 to 5:	Complexity of manual activity - e.g. fine motor activity, movement between containers
2.	Cognitive 1 to 5	Cognitive complexity of the activity - e.g. measurement, labeling
3.	Group 1 to 5	Level of group work and communication required by the activity - e.g. working in groups and communicating with members

**Table 4.2 Represent a scale of 1 to 5. 1 Represent little or no complexity and 5 represent high or strong complexity of activity.**

<b>No</b>	<b>Activity</b>	<b>Manual</b>	<b>Cognitive</b>	<b>Group</b>
1	A mix planting of indigenous groundcover in a container	5	5	1
2	Planting a mixture of rooted vegetable plants.	5	4	1
3	Sowing of a mixture of vegetable seed.	3	5	1
4	Weed, mulching, removal of dead plants, planting of shrubs and groundcover	4	3	2
5	Planting of scented geranium cuttings to grow in a sunny position	4	3	1
6	Planting of mixed herb plants into a container	3	3	1
7	Participants form groups of three and engage in the planting of strawberry plants.	3	3	5
8	Participants form groups of three and engage in the planting of flowering annuals.	3	3	5
9	Participants prick out herb seedlings and transplant this into large containers.	5	4	2
10	Participants partake in general garden maintenance, which included transplanting of groundcovers into garden area.	3	3	2

#### 4.2.1 Implementation Of Horticulture Activities

The selected patients were given an overview of the process prior to the commencement of each designed activity. The activity aspects were clearly described to all participants. This involved a detail presentation of the working materials such as plant material, soil mixtures, garden/hand-tools, pots and plant labels. This procedure allowed the opportunity for questions and answers regarding *any concerns patients or clinicians may have*.

The research team's primary responsibilities were presented prior to the commencement of each activity. The following were the responsibilities the research team had to fulfill to the project participants and the hospital:

- Continuously respect the needs of the participating patients.
- Should there be any adjustments to the process, it will be communicated to the patient and hospital staff.
- *Respect the privacy of the patient, and safeguard all information and materials obtained during the therapeutic horticultural activity process.*
- The study shall not involve practices/activities that does not receive the approval of patients and hospital staff.
- No person to alter or falsify any information related to the study.
- All results to be published and disseminated must be 100% correct. No member of the research staff shall encourage/coach patients to give false responses regarding research results.
- Patients and staff will not work with activity accessories (sharp tools, chemical fertilizers and pesticide), which may cause a safety risk to participants and the immediate environment.
- Information generated during the study may be communicated to those with an essential interest in horticultural therapy. In order for this to occur permission granted by the hospital, staff and patients must be a prerequisite. The hospital, staff and patients shall be made aware of the recipient of such information.
- If information is used in teaching, seminars, workshops, publications, research or writing, the identity of the hospital, staff and patient served shall be protected and remain confidential.

- The results of the research will not contain the true identity of the hospital, staff and patients. The information will be encoded and hospital, staff and patients will be referred to by numbers and/or letters.
- The research team at all times will be rendering a service to the patient and shall be aware that the nature of the service must at all times be professional and promote the welfare of patients and their environment.
- In order for the research to commence the researcher, hospital staff, guardian and participant had to agree to the procedure and conditions as outlined in the Letter of Consent. (Appendix A1)

### 4.3 Content Of Designed Horticulture Activities:

The designed activities were based on similar activities, which are extensively used in programmes by Public Gardens. The designed activities were centered around the following activities: Growing of herbs, learning to take cutting and planting cuttings, planting seeds for outdoor garden, preparing garden site, vegetable gardening, weeding, watering, and planting flowering annuals. (Simson & Straus, 1998) The selection of activities for this research project is further substantiated by Cornille, et al, 1986, where horticulture activities, in particular the propagation of a variety of house plants, were used to raise self-esteem of participants, suffering from substance abuse.

#### 4.3.1 Activity 1: A mix planting of indigenous groundcover in a container

**Description:** Participants learned to plant a mixture of various indigenous groundcovers in a plastic container.

**Time allowed for activity:** 1hr 30 min

**Materials:** Rooted cuttings of the following indigenous plants: *Plectranthus neochilus*, *Arctotis fastuosa*, *Carpobrotus edulis*

Root media: Mixture of compost, river-sand, fine bark, and general organic material.

Drainage chip



Hand trowels  
Watering cans  
Plastic plant labels  
Waterproof markers  
Plastic trays

**Teaching procedure:** The facilitator discussed, displayed and described each plants flower, fruit, or scent, and significance. The facilitator demonstrated how the plants are removed from their cell packs.

The facilitator demonstrated the planting procedure to all participants and co-facilitators.

Each horticulturist took responsibility for a group of 4 participants and followed the procedures as demonstrated by the facilitator.

Base of the trays were covered with a thin layer of drainage chip. Growth media were placed on top of the drainage chip, filling one third of the tray. Chosen plants were removed from cell packs by gently squeezing the cell of the pack to loosen the plant's roots. With the thumb and index finger participants grabbed the plant's main stem at the base and gently pulled out of the cell. The plant was set on top of soil in a designated planting area. The rest of the container was filled with the growth media mixture, and the mixture was firmed until the plant was anchored.

The plants were watered using watering cans. Plants were labeled with the following information: name of participant, date, and plant name.

#### **4.3.2 Activity 2:** Planting a mixture of rooted vegetable plants.

**Description:** Participants learned to plant a mixture of rooted vegetable plants in a plastic container.

**Time allowed for activity:** 1hr 30 min

**Materials:** Rooted cuttings of the following vegetable seedlings: Lettuce: *Lactuca sativa*, Spinach: *Spinachia oleracea*, Tomatoes: *Lycopersicum esculentum*

Root media: Mixture of compost, river-sand, fine bark, and general organic material.

Drainage chip

Hand trowels

Watering cans

Plastic plant labels

Waterproof markers

Plastic trays

**Teaching procedure:** The facilitator discussed, displayed and described each plants flower, fruit, or scent, and significance.

The facilitator demonstrated how the plants are removed from their cell packs.

The facilitator demonstrated the planting procedure to all participants and co-facilitators.

Each horticulturist took responsibility for a group of 4 participants and followed the *procedures as demonstrated by the facilitator.*

Base of the trays were covered with a thin layer of drainage chip. Growth media were placed on top of the drainage chip, filling one third of the tray. Chosen plants were removed from cell packs by gently squeezing the cell of the pack to loosen the plant's roots. With the thumb and index finger participants grabbed the plant's main stem at the base and gently pulled out of the cell.

Plant was set on top of soil in designated planting area. The rest of the container was filled with the growth media mixture, and the mixture was firmed until the plant was well anchored. *The plants were watered using watering cans. Plants were labeled with the following information: name of participant, date, and plant name.*

#### **4.3.3 Activity 3:** Sowing of a mixture of vegetable seed.

**Description:** Participants learned to sow a mixture of vegetable seed in a plastic container.

**Time allowed for activity:** 1hr 30 min

**Materials:** Seed of the following vegetables were sown: Onions: *Allium cepa*, and Carrots: *Daucus carota*  
Root media: Mixture of compost, river-sand, fine bark, and general organic material.  
Drainage chip  
Hand trowels  
Watering cans  
Plastic plant labels  
Waterproof markers  
Plastic trays

**Teaching procedure:** The facilitator discussed, displayed and described each plants flower, fruit, or scent, and significance.

The facilitator demonstrated how the seeds are sown.

The facilitator demonstrated the sowing procedure to all participants and co-facilitators.

Each horticulturist took responsibility for a group of 4 participants and followed the procedures as demonstrated by the facilitator.

Base of the trays were covered with a thin layer of drainage chip. Growth media were placed on top of the drainage chip, and filled one third of the tray. Chosen seeds were removed from packets.

Seed were set on top of soil in designated planting area. The rest of the container was filled with a specified amount of growth media mixture, and the mixture was firmed until the was well covered and anchored.

The seeds were watered lightly using watering cans. Seeds were labeled with the following information: name of participant, date, and seed name.

**4.3.4 Activity 4:** Weed, mulching, removal of dead plants, planting of shrubs and groundcover

**Description:** Participants learned to identify weeds, apply a mulch, removal of dead plants, and planting of shrubs and groundcover in a hospital courtyard.

**Time allowed for activity:** 2 hours

**Materials:** Live weed specimens for identification purpose

Master Organic mix mulch

Shrub: *Leonotis leonitis* var. *leonitis*

Groundcover: *Felicia amelloides*

Organic root stimulant: Bone meal

Garden accessories: spades, rakes, weed digger, wheelbarrow, hosepipe

Plastic plant labels

Waterproof markers

**Teaching procedure:** The facilitator discussed, displayed and described each weed flower, fruit, or scent, and significance. The advantages and disadvantages of weeds were discussed.

The facilitator demonstrated how the weeds are cleared and how shrubs and groundcovers are planted.

The importance of mulch and its application were illustrated to participants.

The facilitator demonstrated the planting procedure to all participants and co-facilitators.

Careful consideration was dedicated to how to handle garden tools correctly and safely. Each horticulturist took responsibility for a group of 4 participants and followed the procedures as demonstrated by the facilitator. The weeds were removed and placed on the wheel burrow. Plants were removed from their bags, roots loosened and planted to a specified depth. Bone meal was placed around the root ball of each plant.

Each hole was back filled with soil. Plants were watered using a hosepipe. Mulch was applied evenly as a top dressing. Plants were labeled with the following information: name of participant, date, and plant name.

**4.3.5 Activity 5:** Planting of scented geranium cuttings to grow in a sunny position

**Description:** Participants learned to plant scented geranium cuttings in a plastic container.

**Time allowed for activity:** 1hr 30 min

**Materials:** Scented geranium cuttings: *Pelagonium citronellum* (Citrus scented) and *Pelargonium tomentosum* (Peppermint scented pelargonium)

Rooting hormone: Serradix 1

Root media: A well-drained moderately light soil consisting of a mixture of river-sand and fine bark.

Drainage chip

Hand trowels

Watering cans

Plastic plant labels

Waterproof markers

Plastic trays

**Teaching procedure:** Introduction: The facilitator explained that this is a large genus of compact plants, which are indigenous to South Africa, and grown mainly for its decorative foliage. Leaves are variable and release distinctive scent when crushed. Geranium is a name often used for members of the family.

The facilitator discussed, displayed and described each plants flower and scent. Participants were given leaves and asked to crush the leaves to experience the scent produced by the geraniums.

Each horticulturist took responsibility for a group of 4 participants and followed the procedures as demonstrated by the facilitator. The facilitator demonstrated the planting procedure to all participants and co-facilitators.

Base of the trays were covered with a thin layer of drainage chip. Growth media was placed on top of the drainage chip, filling one third of the tray. Holes were made in the mixture. A rooting hormone, Serradix, was applied to the base of the cutting, to help stimulate root growth. Stem cuttings were gently placed in the hole in the soil media. It was firmed into place. The hole around the cutting was filled. Plants were

watered using watering cans. Plants were labeled with the following information: name of participant, date, and plant name. Plants were placed in a sunny position. Plant care for the cuttings was discussed with participants.

#### **4.3.6 Activity 6:** Planting of mixed herb plants into a container

**Description:** Participants learned to plant mixed herb plants into a container.

**Time allowed for activity:** 1hr 30 min

**Materials:** Plant material: *Thymus vulgaris* (Thyme), *Salvia officinalis* (Sage), and *Ocimum basilicum* (Basil).

Root media: Well-drained moist soil, which included a mixture of compost, river-sand, fine bark, and general organic material.

Drainage chip

Hand trowels

Watering cans

Plastic plant labels

Waterproof markers

Plastic trays

**Teaching procedure:** Plant features of the herbs were introduced to all participants, in particular the flower colour and flower scent.

The cultivation of each plant was discussed with the group.

The following regarding each herb plant was presented to the group: Uses including decorative, culinary, household, cosmetic, aromatic, and medicinal.

Harvesting procedures and preserving of the various herbs were presented to the group.

The facilitator demonstrated the planting procedure to all participants and co-facilitators.

Each horticulturist took responsibility of a group of 4 participants and followed the procedures as demonstrated by the facilitator.

Base of the trays were covered with a thin layer of drainage chip. Growth media was placed on top of the drainage chip, filling one third of the tray. Holes were made in the mixture.

Rooted plants were gently placed in the hole in the soil media. It was firmed in place. Hole around the plants were filled. The plants were watered using watering cans. Plants were labeled with the following information: name of participant, date, and plant name. Plant care was discussed with participants.

**4.3.7 Activity 7:** Participants formed groups of three and engage in the planting of strawberry plants.

**Description:** Participants learned to plant strawberry plants.

**Time allowed for activity:** 1 hour

**Materials:** Plant material: *Fragaria chiloensis* (strawberry)

Root media: Well-drained moist soil, which included a mixture of compost, river-sand, fine bark, and general organic material.

Drainage chip

Bone meal

Bark mulch

Hand trowels

Watering cans

Plastic plant labels

Waterproof markers

Plastic containers with considerable depth.

**Teaching procedure:** The facilitator explained that this plant should ideally be planted in early to late autumn and not in late spring early summer. In cool climates this permits the plant to become established before winter and they should crop in spring and summer.

The facilitator discussed, displayed and described the strawberry plant flower and fruit.

The facilitator presented the following information regarding the growing conditions of strawberry plants:

**Growing conditions:** The facilitator explained that strawberries will grow in a wide range of soils, but will not tolerate poor drainage. The plants prefer good soil depth, an acid soil to neutral soil with well-rotted organic matter.

**Planting procedures:** Drainage chip was placed at the base of the plastic container. Soil mix was added to the container, making sure the soil was in a damp state. The plant was inserted, making sure that the crown of the plant was just above ground level and that all roots were covered by soil. Strawberries will die if planted too deeply but will dry out if their roots are not planted deeply. The soil was firmed around the roots and watered thoroughly. Plants were placed in a sunny position. Plants were watered regularly until runners appeared.

Watering must be reduced as the berries matured and started reddening. Excessive moisture at this stage will result in soft, flavourless berries. Berries must be allowed to become fully coloured before picking, as they will then have the best flavour.

Plants were labeled with the following information: name of participant, date, and plant name. Plant care was discussed with participants.

**4.3.8 Activity 8:** Participants formed groups of three and engaged in the planting of flowering annuals.

**Description:** Participants learned to plant flowering annuals.

**Time allowed for activity:** 1 hour 30 min

**Materials:** Plant material: *Begonia x semperflorens-cultorum* (Bedding begonia or Wax begonia), and *Impatiens wallerana* (Busy lizzie).



Root media: A light-weight, well-drained rooting media consisting of a mixture perlite, vermiculite, compost, and river sand.

Drainage chip

Bone meal

Hand trowels

Watering cans

Plastic plant labels

Waterproof markers

Plastic trays

**Teaching procedure:** The plants were introduced. The following was mentioned: Impatiens has their origins in Africa and Asia and that Begonia is a garden hybrid. They are annuals, grown for their showy flowers both in the garden as a bedding/edging plant, indoor, on the stoep or as a greenhouse plant. Begonia is also well known for its showy foliage. To encourage flower display, plants must be placed in semi-shaded area. Flowers are in all shades of red, purple, pink, and yellow. Common pest include snails and caterpillars.

The following planting procedure was demonstrated to all participants:

Drainage chip was placed at the base of the plastic container. Two-thirds of the plastic container was filled with growth media.

Two holes were made and plants were gently placed into the holes. The rest of the container was filled with growth media and firmed. Plants were adequately watered.

Plants were labeled with the following information: name of participant, date, and plant name. Plant care is discussed with participants.

**4.3.9 Activity 9:** Participants pricked out herb seedlings and transplanted this into large containers.

**Description:** Participants learned the technique of how to prick out herb seedlings successfully.

**Time allowed for activity:** 2 hours

**Materials:** Plant material: *Petroselinum crispum* "Afro" (Parsely) and *Apium graveolens* (Celery)

Root media: A light-weight, moist but well-drained rooting media consisting of a mixture perlite, vermiculite, organic material and river sand.

Drainage chip

Bone meal

Hand trowels

Watering cans

Plastic plant labels

Waterproof markers

Plastic trays

**Teaching procedure:** Important plant features were introduced: Parsley: Flowers are tiny, borne in flat-topped clusters in summer. Yellow-green. Leaves are divided into tightly curled segments. Dark green. Celery: Leaves are small and flowers are greenish-white. Oregano: Has delicate leaves, in varying shades of green or gold; small white or purlish flowers which are very attractive to bees.

Herbal interest: Parsley: Use chopped leaves in sauces, soups, with cold meat, fish and cheese dishes, with cooked vegetables and in salads.

Celery: Culinary the seed is used to make celery salt; chopped leaves in salads and with a number of cooked dishes, especially fish. Oregano: Leaves are used in salad and stuffing's with cooked meat.

Participants first filled plastic trays with seedling mixture. Participants were informed that seedlings must be handled carefully since they have a delicate root system, which is prone to damage and drying out quickly. Participants were given pointed plastic hand-held tools, which were used to prick out seedlings. The plastic tools were inserted into the soil two centimeters away from the root and five centimeters into the soil. Seedlings were gently lifted out of the soil. Seedlings were immediately transplanted into plastic trays. Soil mix was firmed down to ensure soil makes contact with delicate roots.

Seedlings were placed in a sunny position or semi-shaded area and adequately watered. Seedlings were labeled with the following information: name of participant, date, and plant name. Seedling care is discussed with participants.

**4.3.10 Activity 10:** Participants partook in general garden maintenance, which included transplanting of groundcovers into garden area.

**Description:** Participants learned basic garden maintenance skills and how to make the garden look good all year round.

**Time allowed for activity:** 2 hours

**Materials:** Plant material: *Mimulus luteus* (Monkey plant)

Garden tools: spade, dutch hoe, draw hoe, hand fork, rake, fan rake, wheelbarrow,

Watering equipment: hosepipe and rotary sprinkler

Plastic plant labels

Waterproof markers

**Teaching procedure:** The facilitator mentioned that with careful planning and the correct tools, garden maintenance could be easier than you think.

Participants were trained how to use garden tools effectively. The facilitator demonstrated the following: Spades were used for digging and breaking up the ground and lifting the soil. Hand forks were used for general cultivation such as forking manure and compost into the soil. Hoes were used for weeding around plants. Rakes were used for breaking up the soil and leveling it before planting.

The area was beautified with Monkey plant. Plants were labeled with the following information: name of participant, date, and plant name. Plant care was discussed with participants.

## 5. RESULTS AND DISCUSSION

### 5.1 Introduction:

The sample group consisted of 12 patients admitted at Lentegour Psychiatric Hospital. The sample consisted of 4 patients from each of the following groups: Forensic, Psychiatric, and Intellectually Challenged. Patients were interviewed by hospital clinicians and trained horticulturist. Selection was done using the Horticulture Pre-test Questionnaire (HPTQ) (Figure 3.2)

Five items were included on the pretest questionnaire in order to gain insight into the attitude and interest of the selected patients regarding gardening and gardening related activities. The following patient deficit has been recorded in the Pretest Questionnaire and is applicable for each patient:

- Patient has no or some interest in gardening activities (Learning potential/educational interest).
- Patient does not or sometimes talk with other members and therapist in the ward (Social interaction).
- Patient does not or sometimes care (tidy up, organize their area) for their work environment (Responsibility).

A total of 10 activities were designed and presented in a particular order. Each activity was chosen to facilitate the development of specific skills, knowledge and ability (Simson & Straus, 1998). The Activity Effectiveness Evaluation form (Figure 3.1) was used to measure individual patient response and patient group response to the activities.

The Activity Effectiveness Evaluation consists of data that is essentially quantitative in nature. Data was interpreted using the formulations in Appendix A2. The data was analyzed using the Microsoft Excel package and the Statistical Package for the

Social Sciences (SPSS) version 11.05 for Windows. The data will be analyzed to identify certain meanings and patterns, which will be discussed.

## 5.2 Description Of The Sample

The sample group consisted of 12 patients admitted at Lentegeur Psychiatric Hospital. The table below outlines the number and percentage of patients in each of the 3 groups:

Table 5.1: Patients by group

Group	Frequency	Percent
Psychiatric	4	33.33
Intellectual	4	33.33
Forensic	4	33.33
Total	12	100

The actual total is 99 but has been rounded off to 100

Five Items were included on the pretest questionnaire (HTPQ) in order to gain an insight into the attitude and interest of the selected patients regarding gardening and gardening related activities.

The first item aimed to establish the level of interest in gardening. Table 5.2 illustrates the results. It is important to note that 33.33% indicated 'not at all' interested in gardening, while 58.33% of the responses indicated 'sometimes', and only 8.33% indicated a strong interest.

Table 5.2: Is patient interested in gardening

	Frequency	Percent
Not at all	4	33.33
Sometimes	7	58.33
Most of the time	1	8.33
Total	12	100

The table below shows that the majority did not incorporate gardening as part of their leisure activities in the past.

Table 5.3 Has patient incorporated gardening as part of leisure activities in the past

	Frequency	Percent
Not at all	8	66.66
Sometimes	4	33.33
Most of the time	0	0
Total	12	100

Table 5.4 summarizes the responses for the item, "Does the patients talk to the therapist?" This indicates the patient's level of interaction/communication with clinical workers in a ward environment, and not during the horticultural sessions. This is an important item because the clinical staff were collaborators in the research process. The pretest questionnaire indicated that 83.33% of the patients talked to the therapist 'sometimes', while 16.66 did not talk to therapist at all.

Table 5.4: Does the patient talk with the therapist

	Frequency	Percent
Not at all	2	16.66
Sometimes	10	83.33
Most of the time	0	0
Total	12	100

Table 5.5 indicates that the majority of the sample (83.330 sometimes communicated with other patients in a ward environment. It should be noted the 16.67% did not communicate at. This was as a result of 83.330% of patients preferring to engage in ward activities/chores that involved interacting with fellow ward residents, and 16.67% preferring individual activities.

Table 5.5: Does the patient talk with other members of the ward

	Frequency	Percent
Not at all	2	16.67
Sometimes	8	83.33
Most of the time	0	0
Total	12	100

As pointed out in the discussion regarding the horticultural activities, the study is designed to develop a therapy model. The model is based on an organized and carefully planned and controlled work environment. Table 5.6 indicates the 41% of the sample did not care for the work environment, and 58.33 'sometimes' cared for their work environment. This will need to be monitored in the study.

Table 5.6: Does the patient care for the work environment

	Frequency	Percent
Not at all	5	41.66
Sometimes	7	58.33
Most of the time	0	0
Total	12	100

Besides the Pretest Questionnaire being analyzed statistically, the data obtained from the AEE (Based on the formulations in Appendix A2) were simultaneously used to infer certain meanings. The results of the Pretest Questionnaire (HTPQ), also provided information on the patient groups rating on the subsections within the pretest questionnaire. The subsection is an indication of the patient's level of Learning Potential (Educational interest), Social Interaction, and Responsibility prior to engagement in the horticultural therapy programme.

**Table 5.7: Patient group response for each subsection in the Horticultural Therapy Pretest Questionnaire (HTPQ); Fo (Forensics); Ic (Intellectually challenged); Ps (Psychiatric):**

Description of subsection	Score: Sum score per sub-section/total score) x 100		Level of task accomplishment by patient group prior to horticultural therapy engagement:
Learning Potential (educational interest)	Fo	34%	Low
	Ic	41%	Low
	Ps	50%	Medium
Social Interaction	Fo	47%	Medium
	Ic	44%	Low
	Ps	44%	Low
Responsibility	Fo	44%	Low
	Ic	38%	Low
	Ps	38%	Low



### **5.3 Presentation Of The Data:**

The data is presented in terms of the problem statement, *which is to determine how patients at a healthcare institution respond to various horticulture activities in order to identify activities appropriate for inclusion and design in a horticultural therapy programme.* The researcher has gathered information, which has been codified, arranged, and separated into tables, graphs and charts, each of which corresponds to a particular section of the problem. The sectionalization of the problem is expressed in the form of appropriate subproblems in order to facilitate management of the problem as a whole.

#### **5.3.1 Subproblem 1**

*The first subproblem is to determine if the response of different category of patients to specific horticulture activities differ, in order to select the appropriate activity for each category.*

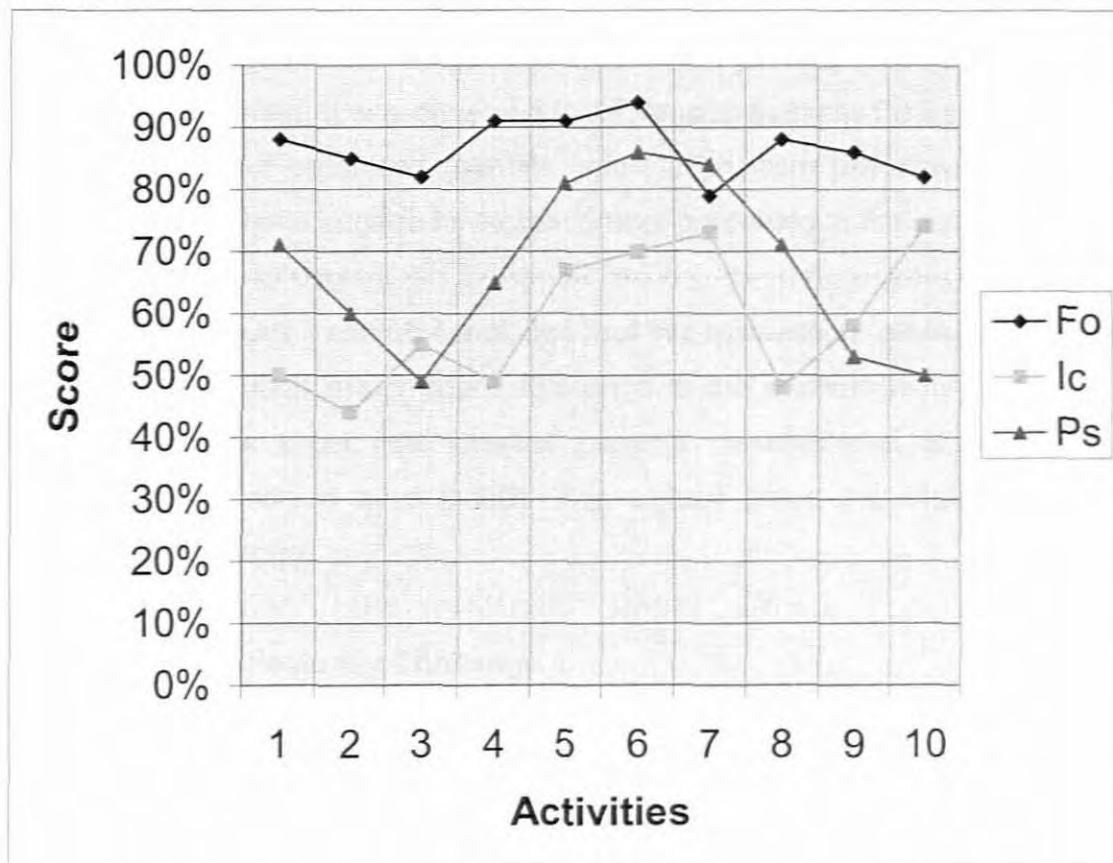
Data collected via the Activity Effectiveness Evaluation questionnaire recorded the results, which illustrates patient group response to each activity, and how patient groups compare with one another: Patient groups were codified in the following manner: Forensic (Fo), Intellectually Challenge (Ic), Psychiatric (Ps)

The data associated with this subproblem is expressed in the form of Table 5.8 and Chart 5.1, which compares the level of task accomplishment by Forensic, Intellectually Challenge, and Psychiatric patients. This illustrates a comparison amongst the patient groups.

**Table 5.8: Patient group response for each activity:**

No	Type of activity	Score: (Average activity score per group per activity/total score) x 100		Level of task accomplishment by patient group:
1.	A mix planting of indigenous groundcover in a container	Fo	88%	High
		Ic	50%	Medium
		Ps	71%	High
2.	Planting a mixture of rooted vegetable cuttings.	Fo	85%	High
		Ic	44%	Low
		Ps	60%	Medium
3.	Sowing a mixture of vegetable seed	Fo	82%	High
		Ic	55%	Medium
		Ps	49%	Medium
4.	Weeding, mulching, removal of dead plants, planting of shrubs and groundcover	Fo	91%	High
		Ic	49%	Medium
		Ps	65%	Medium
5.	Planting of scented geranium cuttings to grow in a sunny position	Fo	91%	High
		Ic	67%	Medium
		Ps	81%	High
6.	Planting of mixed herb plants into a container.	Fo	94%	High
		Ic	70%	High
		Ps	86%	High
7.	Participants form groups of three and engage in the planting of strawberry plants.	Fo	79%	High
		Ic	73%	High
		Ps	84%	High
8.	Participants form groups of three and engage in the planting of flowering annuals.	Fo	88%	High
		Ic	48%	Medium
		Ps	71%	High
9.	Participants prick out herb seedlings and transplant this into large containers.	Fo	86%	High
		Ic	58%	Medium
		Ps	53%	Medium
10.	Participants partake in general garden maintenance, which included transplanting of groundcovers into garden area.	Fo	82%	High
		Ic	74%	High
		Ps	50%	Medium

Chart 5.1



### 5.3.1.1. Patient Group Response To Activities 1 To 10

#### 5.3.1.1.1 Forensics

Table 5.8 and Chart 5.1 illustrate a high level (above 70%) of task accomplishment by forensic patients for activities 1 to 10. This illustrates that forensic patients respond positively to activities, which involves plant materials, soil, sowing of seeds, manual gardening activities, and working with garden tools. Activities requiring individual involvement equally stimulates forensic patients, when compared to those activities which requires group participation. None of the designed activities resulted in a low or medium level of accomplishment for Forensic patients. It can therefore be concluded that general gardening activities and plant materials are considered to be desirable for forensic patients, and may serve to help improve and maintain interest and motivation levels of the individual.

The results suggest that forensic patients are high functioning individuals who can cope with more advanced/complex horticultural activities. As the therapy programme progressed the individuals exercised a high work rate, and time taken to complete tasks became shorter. It was observed that forensics possess the capabilities to take the initiative in an organized manner. Information from interviews indicated that forensic patients have engaged in some form of gardening in the past.

Based on the results it can be concluded that this connection (previously engaged in plant activities) made a significant difference in the motivation for completing the task. The results show that forensic patients demonstrated a consistent, and purposeful response to all activities. This patient group required no supervision during the programme.

#### **5.3.1.1.2 Intellectually Challenge**

Table 5.8 and Chart 5.1 illustrates that intellectually challenged patients had a medium level (46% to 69%) of task accomplishment for the majority of the activities (1, 3, 4, 5, 8, and 9). This indicates that intellectual patients have an interest for working with indigenous groundcover, sowing of vegetable seed, manual task such as weeding, mulching and removal of dead plants, and cultivating scented plant material, such as scented geraniums. The nature of these activities did not comprehensively stimulate successful accomplishment of tasks. Intellectual challenged patients recorded a low level of interest/task accomplishment (44%) for working with rooted vegetable cuttings (activity 2). It was observed that during this activity, this task required a degree of precision and skill, which resulted in a lack of *comprehension and lack of interest*. *This activity required a degree of problem solving, and has a fairly high manual and cognitive complexity according to the grading of the tasks.*

For activities 6, 7, and 10, intellectually challenge patients had high level (above 70%) of task accomplishment. This group of patients required no supervision during these activities. Activity 6, 7, and 8 therefore indicated that planting of herbs into containers, group plantings of strawberry plants, and general garden maintenance, positively stimulated Intellectual challenged patients.

Activities 1, 2, 3, 4, 8, and 9 demonstrated that intellectual patients required supervision, and the clinician and horticulturist had to work side-by-side with each individual. The intellectual patients took much longer to cope with the adjustment of working with plants and to develop a form of independence.

Through interviews, the feedback provided indicated that the adaptation of the patients to working with plants and unfamiliar facilitators, directly affected the individuals ability to complete certain tasks. The vast array of disabilities, such as lacking basic writing and communication skills experienced by these patients, presented numerous problems and resulted in a medium and low level of task accomplishment. Facilitators and clinicians had to speak slowly, use simple sentences, and body language, to help communicate intentions. Too much detail became confusing to individuals and often created a sense of indecision and lack of confidence.

This often resulted in a period of derailment, where the horticultural facilitator had to re-explain the activity to the individual. Unlike forensic and psychiatric patients, visual prompts, repetitive explanations and modeling were required in order to teach certain procedures to the patients. It often become appropriate to regularly stop, take short breaks, and continue with the process.

Activities 1, 2, 3, 4, 8, and 9 had to be broken down into simple steps to aid in comprehension and learning. Safety issues were a primary concern. The use of sharp tools, such as spades, hand spades, and hand forks had to be closely monitored. Individuals in this group become confused about basic practices and often misdirected their actions. An example: Intellectual patients on numerous occasions would water the concrete and unplanted areas, rather than water the planted areas.

The Forensic and Intellectually challenged patient responses show that activity 6, 7, and 10 has the ability to lift the mood, create a sense of excitement and generally increase the feeling of well-being. It was observed that participants were stimulated by group interaction, working with plants that had aromatic foliage, and partaking in outdoor activities, such as general garden maintenance.

### 5.3.1.1.3 Psychiatric Patients

Table 5.8 and Chart 5.1 illustrate that psychiatric patients had a high level (above 70%) of task accomplishment for activities 1, 5, 6, 7, and 8. Psychiatric patients therefore related better to activities which involved planting of indigenous groundcover, working with scented plant material, planting herbal plants, and participating in a group activity.

For activities 2, 3, 4, 9, and 10 psychiatric had a medium level (46% to 69%) of task accomplishment. It was observed that for activity 2, (planting of rooted cuttings) psychiatric patients experienced similar difficulties as reported for intellectual challenged patients. This activity requires precision and skill and has a fairly high manual and cognitive complexity rating. None of the activities were able to record a low level of task accomplishment for psychiatric patients. On the basis of information provided via interviews and observations, psychiatric patients had a sound working relationship with clinicians and facilitators. This relationship had a positive reaction and resulted in an enhancement of the individuals self-esteem, and subsequently a high to medium result for all activities. The repetitive nature of certain horticultural tasks accelerated the process of helping the patient develop conscious control of following instructions, and subsequently their actions. This phenomenon was not observed for the intellectual challenged patients.

### 5.3.1.1.4 Hypothesis no. 1

*The first hypothesis is that different categories of patients will not respond equally to the different types of horticulture activities*

The facts support the hypothetical position and this is illustrated in Chart 5.1 The following distinctions substantiate the hypothetical position:

For forensic patients, none of the designed activities resulted in a low or medium level of accomplishment. Intellectually challenged patients had a medium level (46% to 69%) of task accomplishment for the majority of the activities (1, 3, 4, 5, 8, and 9).

Intellectual challenged patients recorded a low level of interest/task accomplishment (44%) for working with rooted vegetable cuttings (activity 2). Psychiatric patients had a medium level (46% to 69%) of task accomplishment for activities 2, 3, 4, 9, and 10. None of the activities recorded a low level of task accomplishment for psychiatric patients. The results therefore reveal that different categories of patients will not respond equally to the different types of horticulture activities. The hypothesis is therefore accepted.

#### **5.3.1.1.5 The Importance Of Non-Horticultural Activities in the Study**

The results and its interpretation therefore make it possible for aspects of this study to be compared with previous research work. Throughout the research study, facilitators mainly relied on plant material to accomplish project objectives.

Another way to create interest from participants will be for, facilitators to engage participants in non-horticultural engagements. In a study conducted by Schwebel (1993) a horticultural therapist made use of several psychological concepts, theories, and techniques in order to help their clients. For this research study, and particularly for intellectually challenged participants, the horticulturist and clinician staff presented themselves as caring, concerned, and knowledgeable individuals. This included the use of an ice-breaker, prior to commencement of an activity. Prior to each horticultural therapy activity, project facilitators had to deliberately engage in meaningful conversation with participants. This allowed the facilitator to develop an insight into the participants. The development of a relationship and interaction with the patients helped to convey the importance of the participant assuming a sense of ownership for tasks completed during the programme.

Upon the completion of the activity, facilitators would allow for an opportunity of participant feedback. This feedback was reinforced with positive/constructive comments from the facilitators. After every activity participant's achievements were rewarded with refreshment treats.

The study illustrate that, although plant material serves as a vehicle to connect the facilitator to their participants, it is also the facilitator, with the correct approach, who can promote growth and development within their participants. As in the situation with Schewbel (1993), this study shows that the psychological aspects of horticultural therapy utilized by a horticulturist play an important role to successfully engage participants.

### **5.3.2 Subproblem 2**

*The second subproblem is to evaluate the degree of effect of the different horticulture activities on each category of patients, in order to determine the relative importance of each activity in the programme in meeting the patients needs.*

The sub-sections of the Activity Effectiveness Evaluation questionnaire (Figure 3.1) provide a deeper understanding of how each activity affected each patient category. The data germane to this subproblem is expressed in the form of and Chart 5.2, 5.3, and 5.4, derived from Table 5.9, which illustrates a comparison of the level of task accomplishment per activity for each of the sub-sections (Avocational/educational, Interpersonal/social, Responsibility) for each patient group.



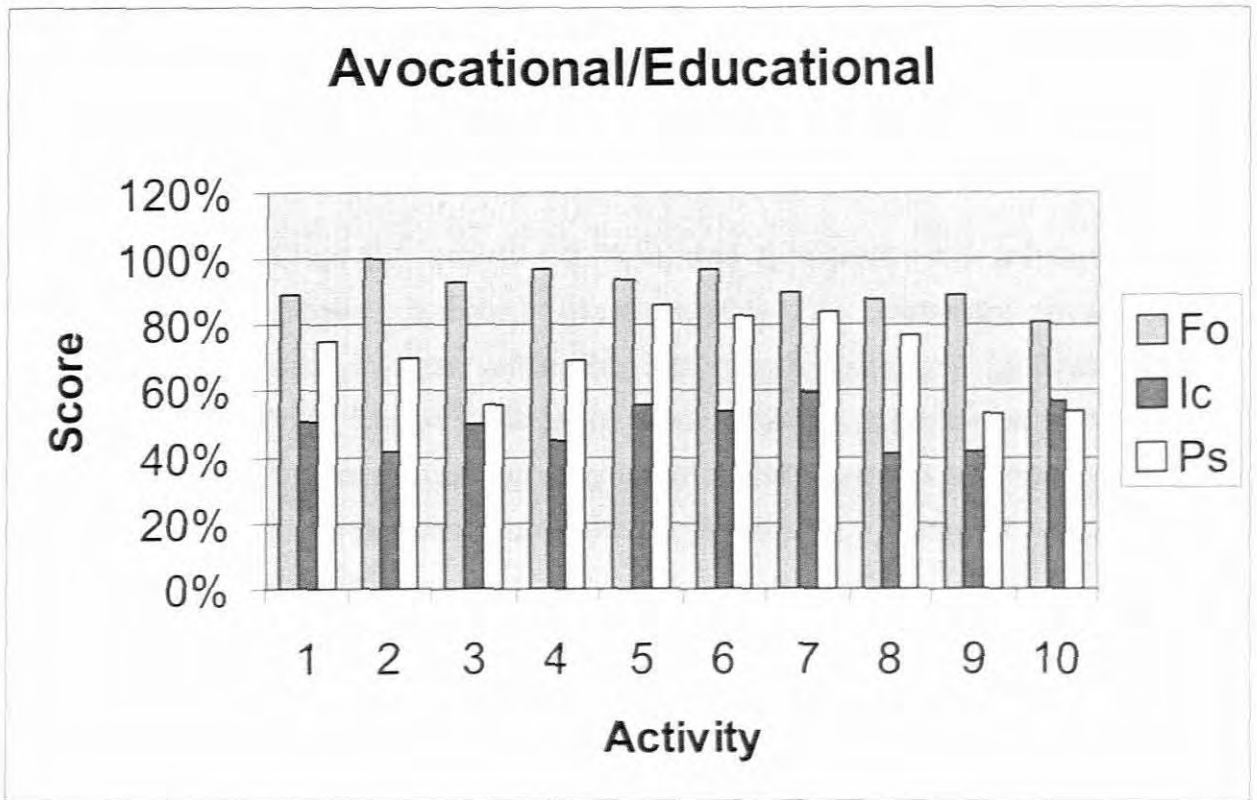
**Table 5.9: Levels of task accomplishment for the various subsections for each activity, indicating the response of each category of patient.**

AEE sub-sections		Avocational/educational		Interpersonal/social		Responsibility	
		Average score per sub-section per patient group (Derived from Appendix B4, B5, B6)	Level of task accomplishment for sub-section by patient group	Average score per sub-section per patient group (Derived from Appendix B4, B5, B6)	Level of task accomplishment for sub-section by patient group	Average score per sub-section per patient group (Derived from Appendix B4, B5, B6)	Level of task accomplishment for sub-section by patient group
<b>Activity 1</b>	Fo	89%	High	88%	High	92%	High
	Ic	51%	Medium	76%	High	45%	Low
	Ps	75%	High	62%	Medium	75%	High
<b>Activity 2</b>	Fo	100%	High	82%	High	75%	High
	Ic	42%	Low	55%	Medium	31%	Low
	Ps	70%	High	46%	Low	59%	Medium
<b>Activity 3</b>	Fo	93%	High	81%	High	92%	High
	Ic	50%	Medium	58%	Medium	61%	Medium
	Ps	56%	Medium	39%	Low	44%	Low
<b>Activity 4</b>	Fo	97%	High	92%	High	75%	High
	Ic	45%	Low	58%	Medium	44%	Low
	Ps	69%	Medium	64%	Medium	58%	Medium
<b>Activity 5</b>	Fo	94%	High	99%	High	91%	High
	Ic	56%	Medium	87%	High	66%	Medium
	Ps	86%	High	76%	High	77%	High
<b>Activity 6</b>	Fo	97%	High	87%	High	100%	High
	Ic	54%	Medium	81%	High	94%	High
	Ps	83%	High	87%	High	94%	High
<b>Activity 7</b>	Fo	90%	High	83%	High	83%	High
	Ic	60%	Medium	87%	High	81%	High
	Ps	84%	High	88%	High	79%	High

**Table 5.9**

<b>Activity 8</b>	Fo	88%	High	90%	High	99%	High
	Ic	41%	Low	57%	Medium	52%	Medium
	Ps	77%	High	75%	High	81%	High
<b>Activity 9</b>	Fo	89%	High	79%	High	88%	High
	Ic	42%	Low	69%	Medium	75%	High
	Ps	53%	Medium	54%	Medium	55%	Medium
<b>Activity 10</b>	Fo	81%	High	88%	High	94%	High
	Ic	57%	Medium	88%	High	97%	High
	Ps	58%	Medium	43%	Low	54%	Medium

**Chart 5.2**



### **5.3.2.1 Patient Group Response To Sub-Section Avocational/Educational**

#### **5.3.2.1.1 Forensic**

With reference to Chart 5.2, subsection avocational/educational for activities 1 to 10 recorded a high level (70% and more) of task accomplishment.

This illustrates that Forensics enjoyed manual activities such as: filling pots with soil, placing cutting in pots, watering plants, and handling garden tools. Forensics responded positively to being able to write the plant details on labels, and remember plant names.

#### **5.3.2.1.2 Intellectually challenged**

With reference to Chart 5.2, activities 2, 4, 8, and 9, recorded low levels of task accomplishment. These activities were unable to stimulate levels of avocational/educational interest within the intellectual challenged patients. This illustrates that planting rooted cuttings, outdoor activities such as weeding and mulching, participating as a group, pricking out of herbal seedlings and transplanting this into containers, did not contribute towards developing a sense of educational interest within participants.

#### **5.3.2.1.3 Psychiatric**

With reference to Chart 5.2 activities 1, 2, 5, 6, 7, and 8 the avocational/educational abilities of participants improved. The level of task accomplishment for this subsection was high. This implies that activities which involved planting of indigenous groundcover, working with rooted vegetable cuttings, planting scented geraniums and herb plants, and participating as a group, stimulated abilities avocational/educational interest within participants. Activities 3, 4, 9, and 10 recorded a medium level of task accomplishment.

This indicates that sowing of vegetable seed, weeding, mulching, removal of dead plants, planting of shrubs and groundcover, pricking out plants, and general garden

maintenance activities, did not comprehensively encourage avocational/educational interest within psychiatric participants.

#### **5.3.2.1.4 The Implication Of Greenhouse Work And Outdoor Space As A Form Of Horticultural Therapy**

The results of this study confirm that certain plant related activities promote avocational and educational interests amongst forensics, intellectually challenged, and psychiatric participants. The following question can be raised: Other than the designed activities used in the current research, what else can promote the learning abilities/interest level of participants?

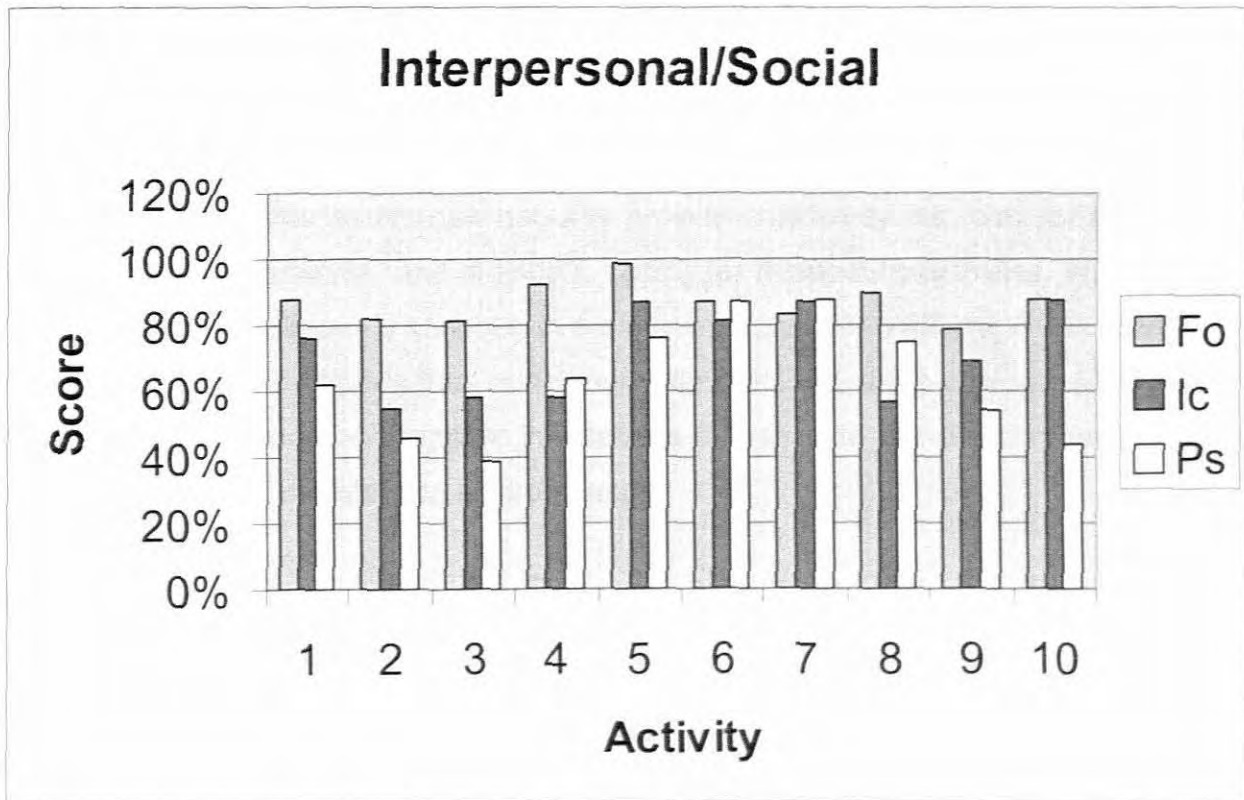
In a study conducted by Christine Wotowiec (1998) participants were engaged in workshops in order to understand the concepts of horticultural therapy. Participants participated in greenhouse related tasks, which emphasized learning and improvement of concentration skills. These tasks involved hands-on activities. Participants who partook in the programme showed an increased stimulation towards learning, and a desire to participate in future horticultural projects. Additional benefits included progress in motor control, social skills, and self-esteem.

In a study conducted by Eckerling (1996) a range of guidelines are represented for the design of healing gardens. She argues that any outdoor space enhances healing, and that the therapeutic values of a garden is not solely dependent on certain activities. However she does identify garden characteristics and plant qualities, which are recommendable for an environment designed to stimulate the participants in a holistic manner. Her recommendations encourage the use of the senses of sight, sound, smell, touch, and taste. Her study recommends the following practical implications:

- Raised planting beds facilitates easier planting. Select areas, which have equal shade, sun, and is protected from prevailing winds.
- Elements must promote visual attractions, and spaces must have plants varieties with various textures and shapes.
- She recommends the use of anti-depressant scent plants (basil, chamomile, cedar, sage, rosemary, thyme, geraniums). Tactile experiences can be enhanced by providing flowers with petals, seedpods, leaves on trees, and bark.

5.3.2.2. Patient Group Response To Sub-Section Interpersonal/Social

Chart 5.3



### **5.3.2.2.1 Forensics**

The results and its interpretation make it possible for aspects of this study to be compared with previous research work. The work of Gesler (1992, 1993), on the notion of therapeutic landscapes, is of particular importance to this study. Gesler suggests that certain environments promote mental and physical well-being and that these landscapes are not necessarily natural but can be created. Gesler's concept suggests that specific landscapes not only provide an identity but, can act as the location of social networks, and provide a setting for therapeutic activities. Williams (1998) substantiate Gesler's concept. In a study conducted by Williams it was found that therapeutic landscape is thus concerned with a holistic, socio-ecological model of health that focuses on complex interactions that include the physical, mental, emotional, spiritual, societal and environmental

The results of this study support Gesler's' and Williams's theory. An analysis of Chart 5.3 shows the forensic group, for subsection interpersonal/social, recorded a high level (70% and more) of task accomplishment on activities 1 to 10. The horticultural activities provided an opportunity for forensic participants to interact and this resulted in interpersonal/social skills developing within forensic participants. While engaged in these activities, they were able to talk to other patients and staff, share tools and space, and work in groups.

The environment involving plant related activities therefore provided for an ideal environment to promote mental well-being of forensic patients.

### **5.3.2.2.2 Intellectually challenged**

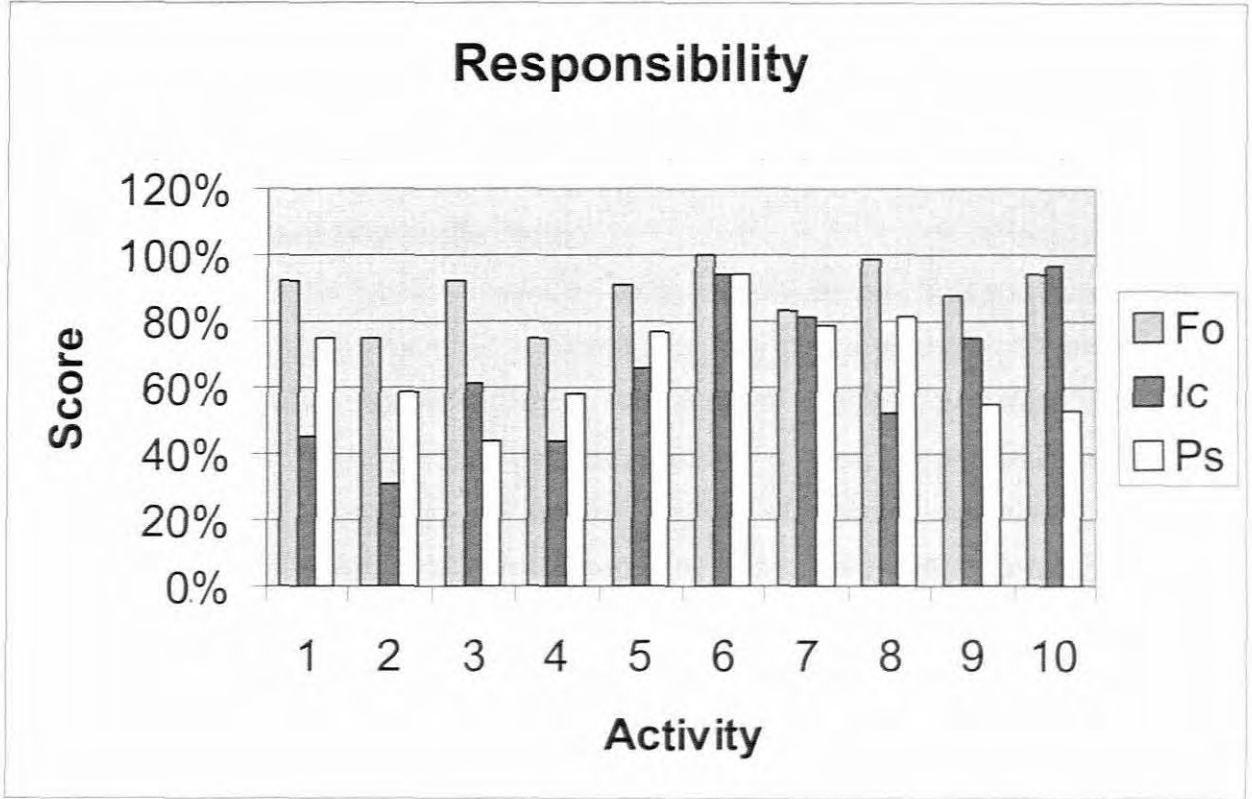
With reference to Chart 5.3 (Derived from Table 5.9 and Appendix: B4, B5, and B6), activities 1, 5, 6, 7, and 10 stimulated interpersonal/social developments within intellectual challenged patients. Participants recorded a high level of task accomplishment on these activities. This indicates that the following plant related activities promoted social interaction between intellectually challenged patients, other group members and facilitators: planting of indigenous groundcover, working with scented geranium cuttings, planting mixed herbs, participating in a group to

plant strawberry plants, and participating in a group to engage in general garden maintenance. These activities encouraged participants to talk with fellow participants, share space and tools, and stimulated conversational interest regarding the plant type chosen. From discussions at the closure of each activity, intellectually challenged patients found these activities to be most meaningful. The participants acknowledged that activities 1, 5, 6, 7, and 10 connected them to other members in the programme. The research results share certain similarities with work completed by Stamm and Barber (1999). Stamm and Barber indicated that plants provide a meaningful emotional connection for humans. In their study it is acknowledged that participants have found this connection to be the most significant during their stay in hospitals.

#### **5.3.2.2.3 Psychiatric**

An analysis of Chart 5.3 shows that, Interpersonal/social abilities improved when participants engaged in activities 5, 6, 7, and 8. Participants recorded a high level of task accomplishment on these activities. Participants enjoyed working with scented geraniums, mixed herbs, and interacting as a group. Activities 1, 4, and 9 recorded a medium level of task accomplishment. This indicates that planting indigenous plants, weeding, mulching, removal of dead plants, and planting shrubs and groundcover, did not drastically encourage the development of interpersonal/social skills. Activities 2 and 3 recorded low levels of task accomplishment. This therefore indicates that planting of rooted cuttings, and sowing of vegetable seed, did not have the ability to effectively stimulate interpersonal/social development.

Chart 5.4





### **5.3.2.3.1 Forensic**

With reference to Chart 5.4 (Derived from Table 5.9 and Appendix B4, B5, B6), for subsection responsibility, activities 1 to 10 recorded a high level of task accomplishment. This indicates that the activities encouraged forensic patients to be able to follow directions/ sequences of tasks, patients cooperating with others, and patients taking the initiative.

### **5.3.2.3.2 Intellectually challenged**

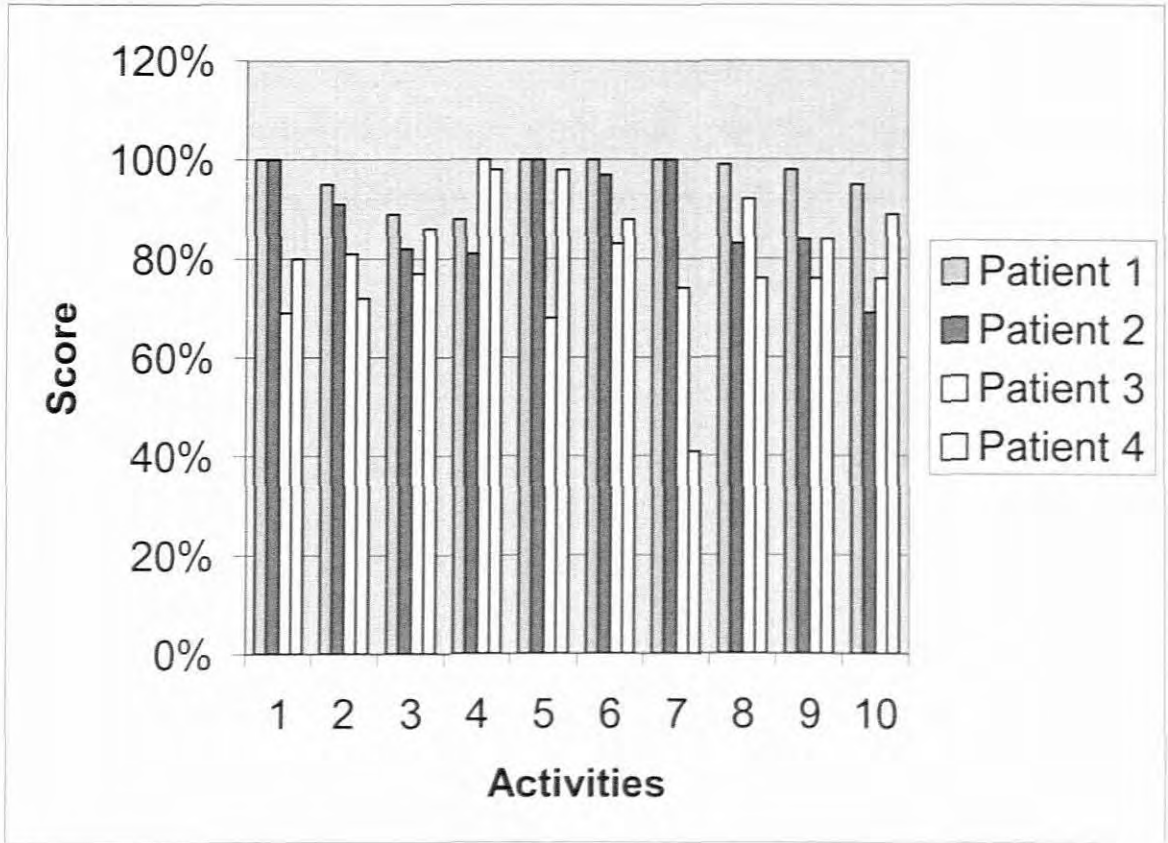
With reference to Chart 5.4, for subsection responsibility, activity 1, 2 and 4 recorded low levels of accomplishment. This shows that planting a mixture of indigenous groundcover, planting rooted cuttings, and manual outdoor activities did not encourage participants to follow directions/sequence of task, cooperate with others by cleaning up after an activity, and develop a sense of initiative. Activities 3, 5, and 8 did not significantly develop/achieve a sense of responsibility within participants. A medium level of task accomplishment for this sub-section was recorded. Activities 6, 7, 9, and 10 positively stimulated a sense of responsibility within each participant. A high level of task accomplishment was recorded on these activities.

### **5.3.2.3.3 Psychiatric**

With reference to Chart 5.4, for subsection responsibility, activities 1, 5, 6, 7, and 8, recorded a high level of task accomplishment. Activities involving planting of indigenous groundcover, planting scented geraniums, planting mixed herbs, and participating in groups stimulated participants to follow sequences of task, cooperate with others, and take the initiative. Activities 2, 4, 9, and 10, recorded medium levels of task accomplishments. This illustrates that activities such as planting of rooted vegetable cuttings, weeding, mulching, removal of dead plants, planting of shrubs and groundcover, pricking out herb seedlings, and participating in manual outdoor garden activities, did not drastically influence participants to follow task sequence, cooperate with others, and taking the initiative. Activity 3 recorded a low level of task accomplishment, indicating that sowing of a mixture of vegetable seed did not encourage responsibility abilities within psychiatric participants.

### 5.3.2.4 Individual Patient Response Within Each Category.

Chart 5.5



#### 5.3.2.4.1 Forensic Patients

Chart 5.5 (Derived from Appendix B1) shows data collected via the Activity Effectiveness Evaluation and illustrates distinctions in response to activities between individual patients.

Activity 1, which is a mix planting of indigenous groundcover in a container, recorded a high level of task accomplishment (100%) for three forensic patients (P1, P2, P4). One forensic patient (P3) recorded a medium level (69%) of task accomplishment. For activity 6 to 9 all forensic patients had a high level (70% to 100%) of task accomplishment. Activity 10 recorded a high level of task accomplishment for patients 1, 3, and 4. For activity 10, patient 2 recorded a medium level (69%) of task accomplishment. The results therefore reveal that within the forensic category, patients responded better to certain horticultural activities than to others.

### 5.3.2.4.2 Intellectually Challenged

Chart 5.6

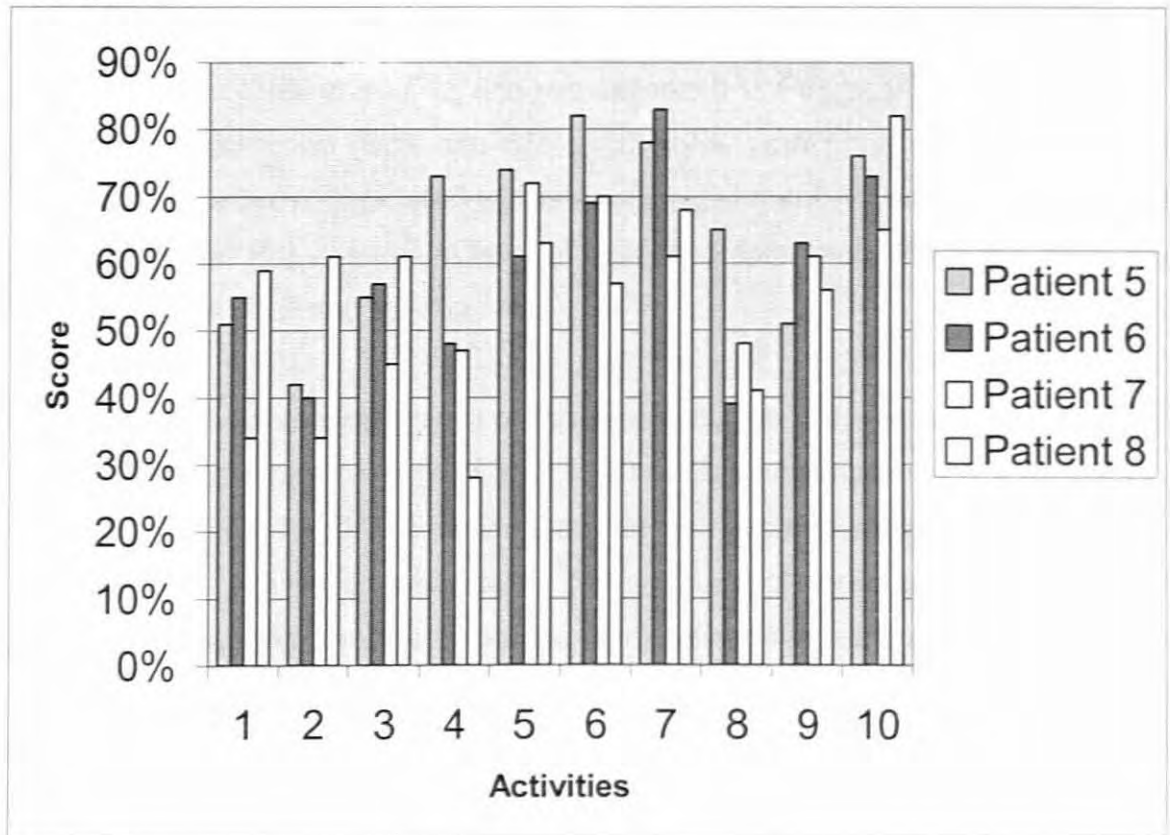


Chart 5.6 (Derived from Appendix B2) shows data collected via the Activity Effectiveness Evaluation and illustrates distinctions between individual patients within the intellectually challenged group.

For activity 1, a mix planting of indigenous groundcover, three patients (P5, P6, P8) recorded a medium level of task accomplishment (51% to 59%). One patient (P7) recorded a low level of task accomplishment (34%). For activity 2, planting a mixture of rooted vegetable cuttings, three patients (P5, P6, P7) recorded a low level of task accomplishment (42%, 40%, and 34%). One patient (P8) recorded a medium level of task accomplishment (61%). Activity 3, sowing a mixture of vegetable seed, three patients (P5, P6, P8) recorded a medium level of task accomplishment (55%, 57%, and 61%).

One patient (P7) recorded a low level of task accomplishment (47%). Activity 4, weeding, mulching, removal of dead plants, planting of shrubs, and groundcover,

recorded a high level of task accomplishment (73%) for patient 5, a medium level of task accomplishment (48% and 47%) for patient 6 and 7, and a low level of task accomplishment (28%) for patient 8. Activity 5, planting of scented geranium cuttings to grow in a sunny position, two patients (P5, P7) recorded a high level of task accomplishment (74% and 72%), and two patients (P6, P8) recorded a medium level of task accomplishment (61% and 63%). Activity 6, planting of mixed herbs into a container, recorded a high level of task accomplishment (82% and 57%) for two patients (P5 and P7). A medium level of task accomplishment (69% and 57%) was recorded for patient 6 and 8.

Activity 7, participants form groups of three and engage in the planting of strawberry plants, recorded a high level (78% and 83%) of task accomplishment for patients 5 and 6. For patients 7 and 8, a medium level of task accomplishment (61% and 68%) was recorded. Activity 8, participants form groups of three and engage in the planting of flowering annuals, recorded a medium level of task accomplishment (65% and 48%) for patients 5 and 7. For patients 6 and 8, a low level of task accomplishment (39% and 41%) was recorded. Activity 9, participants prick out herb seedlings and transplant this into large containers, recorded a medium level of task accomplishment (51% to 63%) for all four patients in this category. Activity 10, participants partake in general garden maintenance, which include transplanting of groundcovers into garden areas, recorded a high level of task accomplishment (73%, 76%, and 82%) for patients 5, 6, and 8. Patient 7 recorded a medium level of task accomplishment (65%).

The results therefore reveal that within this category, patients responded better to certain horticultural activities than to others.

### 5.3.2.4.3 Psychiatric Patients

Chart 5.7

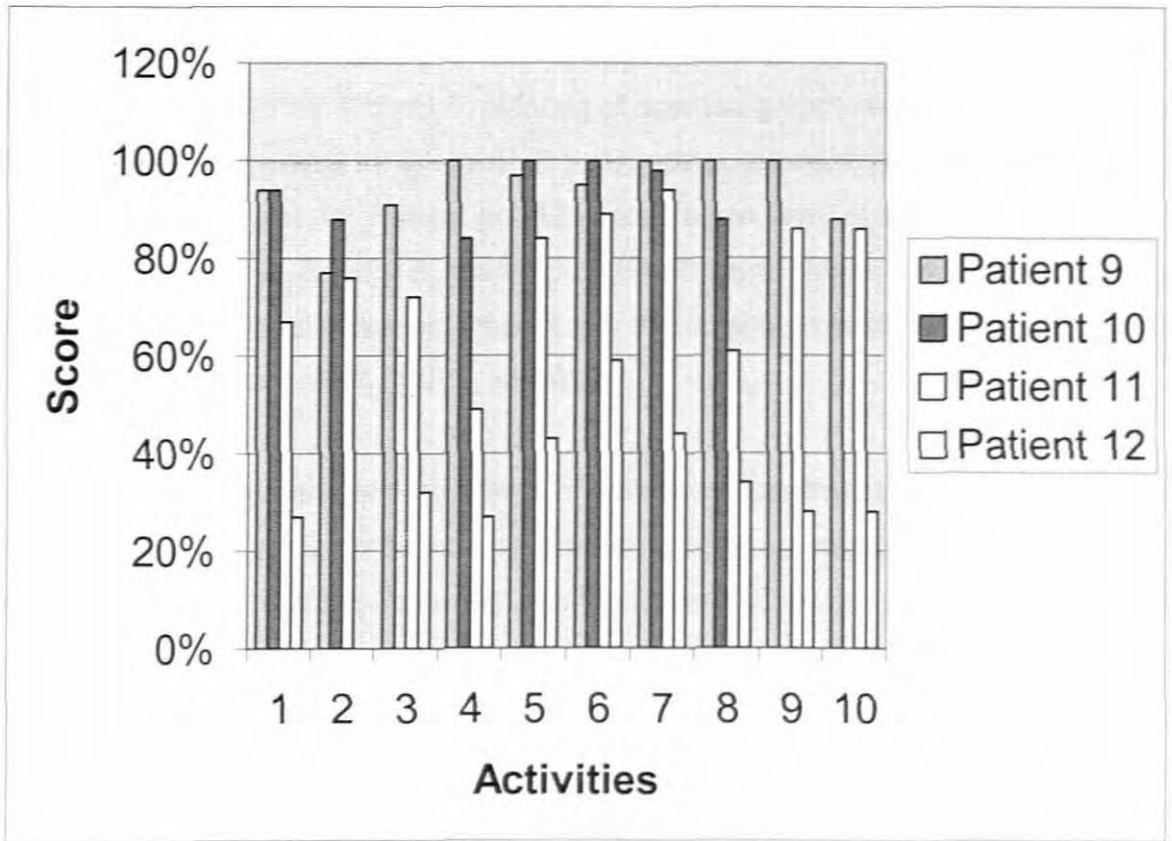


Chart 5.7 (Derived from Appendix B3) shows data collected via the Activity Effectiveness Evaluation and illustrates distinctions, between individual patients as regards to their response to activities.

Activity 1, a mix planting of indigenous groundcover in a container, recorded a high level of task accomplishment (94%) for patient 9 and 10. Patient 11 recorded a medium level of task accomplishment (67%). A low level of task accomplishment (27%) was recorded for patient 12. Activity 2, planting a mixture of rooted vegetable cuttings, recorded a high level of task accomplishment (77%, 88%, and 76%) for patients 9, 10, and 11. patient no. 12 was absent for this activity. Activity 3, sowing a mixture of vegetable seed, recorded a high level of accomplishment (91% and 72%) for patient no. 9 and 11.

Patient no. 12 recorded a low level of accomplishment (32%), and patient no. 10 was absent. Activity 4, weeding, mulching, removal of dead plant, planting of shrubs and groundcover, the following was recorded: Patient no. 9 and 10 recorded a high level of task accomplishment (100% and 84%), patient no. 11 recorded a medium level of task accomplishment (49%), and patient no. 12 recorded a low level of task accomplishment (27%). Activity 5, planting of scented geranium cuttings to grow in a sunny position, recorded a high level of task accomplishment (97%, 100%, 84%) for patient no. 9, 10, and 11. Patient no. 12 scored a low level of task accomplishment (43%) for activity 5. Activity 6, planting of mixed herb plants into a container, the following results were recorded: Patient no. 9, 10, and 11 recorded a high level of task accomplishment (95%, 100%, and 89%).

Patient no. 12 recorded a medium level of task accomplishment for activity 6. Activity 7, which involved participants forming groups of three and engaging in the planting of strawberry's, recorded the following results: Patient 9, 10, and 11 recorded a high level of task accomplishment (100%, 98%, and 94%). Patient no.12 scored a low level of task accomplishment (44%). Activity 8, which involved participants forming groups of three and engaging in the planting of flowering annuals, recorded the following results: Patient no. 9 and 10 recorded a high level of task accomplishment (100% and 88%). Patient 11 scored a medium level of task accomplishment (61%). Patient no. 12 recorded a low level of task accomplishment (34%). Activity 9, involved participants in pricking out herb seedlings and transplanting this into large containers. This recorded a high level of task accomplishment for patient no. 9 (100%) and patient no. 11 (86%). Patient 12 recorded a low level of task accomplishment (28%). Activity 10, participants partook in general garden maintenance, which included transplanting of groundcovers into garden area, patient no. 9 and 11 scored high levels of accomplishment (88% and 86%) Patient no.12 recorded a low level of task accomplishment (28%). Patient no. 10 was absent for this activity.

The results therefore reveal that within this category, patients will respond better to certain horticultural activities than to others.

### **5.3.2.5 The Significance Of Plant Characteristics In A Rehabilitation Environment.**

The result for sub-section responsibility indicates that plant and the nature of the gardening/horticultural activities stimulated participants. Patient groups Forensics and Psychiatric recorded a high level of task accomplishment, except for the Intellectually Challenged group, where only 40% of activities stimulated a sense of responsibility.

The selection and the use of plant materials for the current research work did not emphasize the sensory characteristics/qualities of the chosen plant's enough. This raises the following question: Would the results have been more positive (particularly for the Intellectually challenged) if more emphases were placed on the distinctive sensory characteristics of plants? The accounts of previous research work indicate that the sensory qualities of plants have a profound influence on the participants and their environment. The research of Durham and Kenline (1996) research elucidates the connection between chosen plant types and rehabilitation within the participant. Participants chosen for this research suffered from Alzheimer's illness or similar disorders. Based on the appropriate choice of plant types, garden elements created a therapeutic environment. Plant types chosen included perennials such as herbs, cut flowers, and plants suitable for drying. The research included plants capable of providing sensory stimulation such as lavender, sage, thyme, oregano, and chives.

Barns (1996) recommend the choice of sensory plants to assist individuals with the healing process. The study reveals that there is a strong correlation between environmental stimuli and emotional healing. The researcher suggests the use of plants with fragrant foliage, strong foliage textures, and colours. Edible plants are recommended for stimulating the taste buds. The psychological and physiological benefits of horticultural therapy are further illustrated in a study done by Gray (1999) for persons with dementia and physical frailties. To stimulate the human senses of participants, plants were selected for their tactile, gustatory, olfactory, auditory and cognitive benefits.

### **5.3.2.6 Hypothesis no. 2**

The second hypothesis is that each category of patients will respond better to certain horticultural activities than to others according to specific therapeutic needs.

The general findings support the hypothetical position. The various patient categories responded differently to the subsections avocational/educational, interpersonal/social and responsibility as shown in the results. Individual patients within the categories also differed in their response to the various activities. The results of the study indicate that certain horticultural activities have an impact on patients deficiencies and encourage their specific needs in the following areas: Avocational/educational, interpersonal/social and responsibility/development.

The identification of these activities aid the development and design of a more focused horticultural therapy model.

### **5.3.3 Subproblem 3**

*The third subproblem integrates the results of the above subproblems in order to design a horticultural therapy model.*

Subproblem 3 examines the results, and the research project in its entirety. On this basis it explores the criteria, and elements, which advances and facilitates the therapeutic qualities of gardens and horticultural activities. The guidelines intend to provide a framework for addressing specific needs/design qualities that would enhance and enrich a horticultural therapy programme for a horticulturist interacting with a healthcare worker. In order to formulate a framework, it must be emphasised that it is important for a horticulturist to understand the health issues of the participants and the healthcare facility.

The recommended guidelines take into account the work done by previous researchers. Kamp (1996) explores the importance of the technical criteria required for the planning and design of a horticultural therapy programme. The study reiterates the importance of balancing design considerations with technical criteria.



In this study Kamp recommends that the following must be critically considered: Site i.e. Where will the garden be? Participants i.e. Who will be using the garden? Goals and programme i.e. What do you want to accomplish there and how will it be done? Budget i.e. What funds do we have to work from? This study identifies the following specific design principles that must be considered: Site analysis, diversity in site design, accessibility and ease of use, diversity of plant material, and quality maintenance.

In a study done by Predney and Relf (1999) examples are cited of potential variables. The researcher recommends that the first step before implementing any research programme is to establish good communication with the administrators and staff at the facility where the research will take place. The following concerns must be taken into account: Facility's interest and support for horticultural therapy research.

The facility's knowledge of research and methodology, their flexibility and adaptability in integrating into a research project, their philosophies and goals for their clients, their awareness of the constraints and requirements, and the availability of space and resources.

The guideline is an integration of "first-hand" experience and previous research work. It takes into account the views/response received from participants, clinical workers, and facilitators. It may or may not be applicable at another health care facility. The following components constitute the guidelines: ethical issues, identification of activities/treatment plan, and components of rendering a horticultural therapy service.

#### **5.3.3.1 Ethical Issues:**

Cognisance must be taken of the health care facility, as well as government's set standards on the appropriate management of human subjects. The horticulturist often represents an organisation (university, technikon, botanical institution, NGO etc), which may have internal rules/review boards, which could supplement additional rules and regulations, as outlined by the hospital or legislation. It is

paramount that all programme facilitators be guided by these rules/regulations. Everyone involved on the programme must conduct themselves in a professional manner. There can be no tolerance for unprofessional behaviour.

Adherence to the following shall guide the horticulturist conduct:

The horticulturist's primary responsibility is to the client.

The horticulturist and programme colleagues must at all times deliver/demonstrate competent behaviour.

All programme facilitators must respect the privacy and confidentiality of the client served and safeguard all information and materials obtained during the therapeutic horticultural activity.

In order for patients to engage in activities, the programme coordinator must receive the consent of the hospital, staff, patient, and/or guardian. This consent must be communicated by means of a Letter of Consent. (Appendix A1)

The selected participants must be given an overview of the process prior to its commencement. This will encompass an overview of the content of the activities, materials, and tools.

#### **5.3.3.2 Identification Of Activities/Treatment Plan:**

Within a hospital environment, patient's abilities are often limited. This can be as a result of the physical environment, or an individual disability. Selection of programme participants must be based on an accurate, systematic approach, which evaluates/determines the patient's functional level (mental and physical), willingness to participate, and personal interest. The designed programme is therefore adapted to accommodate the limitations of the patient. The selection team may consist of a combination of the following clinicians: psychologist, social worker, occupational therapist, and a horticulturist. Each horticultural therapy programme must be designed to ultimately compliment the overall treatment issues of the patient. The activities must be measurable. Each activity must have objectives and goals. Once participants have engaged in an activity, a progress report must be documented.

This pilot study, documented the response of three groups of patients (Forensic, Intellectually Challenged, and Psychiatric). Based on the results, relevance can be given to certain activities when designing a horticultural therapy programme. The results indicate that activities 6 and 7, received a high level of task accomplishment by all participants. Working with plants, which have herbal properties (activity 6) and interacting in groups to plant edible fruit bearing plants (strawberries) (activity 7) was most favored by all participants. Patient response shows that members are able to share with, learn from and contribute to each other's experiences and rehabilitation during group interaction. Information obtained from interviews with participants indicated activity 6 & 7 stimulated a significant increase in task accomplishment, self-esteem, and social interaction. With sub-section avocational/educational, activities 1, 2, 5, 6, 7, and 8 recorded a high level of task accomplishment by forensic and psychiatric participants. These activities encouraged participants to follow task sequences, work with garden tools effectively, develop a sense of curiosity (ask questions), and be able to write down plant information. With subsection interpersonal/social, activities 5, 6, 7, and 8 recorded high task accomplishment by all participants. The nature of these activities promoted conversational interest amongst participants. With subsection responsibility, activities 6 and 7 recorded high task accomplishment for all groups of patients. The nature of these activities encouraged patients to follow sequences, cooperate, and take initiative.

### **5.3.3.3 Components Of Rendering A Horticultural Therapy Service:**

The pilot study/research was conducted as a service rendered to the hospital. This undertaking highlighted several dimensions (components), which enhanced the professionalism of the programme. The inclusion of these components assured deliverance of quality.

An assessment, needs, and feasibility study has to be completed before commencing with the programme. This assessment outlined the goals and objectives of the programme as well as client goals and objectives. A horticultural therapist assessment begins with the following: Definition of the population group to determine the functioning level of clients as well as definition of specific programme

goals. Ascertain the documentation or evaluation that is available at the facility to chart client progress and goal achievement. Evaluate the facility and its physical logistics and determine whether there are specific challenges to resolve.

Establishing the cost implications: An appropriate fee must be based on the frequency of the programme, number of clients, and materials. Horticultural therapists generally charge a fee per hour. Some facilities charge per client. All programme costs must be determined and may include preparation time, transportation, supplies, taxes, insurance and refreshments. As part of the horticultural therapy programme the budget must be clearly stated in the contract. Payment for service rendered is either up front or by reimbursement. If resources are limited for the facility, alternate methods for procuring materials must be considered, such as donations from garden centers, wholesale nurseries, and related business. Record keeping of project materials will help estimate future project needs and help determine an accurate budget for future projects.

#### **5.3.4 Subproblem 4**

*The fourth subproblem is to identify factors necessary for the design of a business plan for a horticulturist to engage in a horticultural therapy programme under local conditions.*

The purpose of the business plan is to provide an outline to develop, market and implement a horticultural therapy service for a variety of health care facilities. The business plan further helps a horticultural therapist to thoroughly investigate all the ramifications of setting up a business and practicing as a contract worker.

In a study conducted by Christine Wotowiec (1998), it demonstrates how horticulture is utilized as a tool to create opportunities, amongst these being business opportunities for Egyptians. The circumstances/challenges faced by a horticulturist in Egypt is very similar to challenges faced by a horticulturist in South Africa, attempting to establish a business. In Egypt challenges included lack of materials/resources, limited budgets, and participants having little knowledge of science subjects.

Mattson, et al (1993) proposed Standards of Practice essential for a quality horticultural therapy service. In this study the following aspects are emphasized: Client services, administration, organizational goals, networking, personnel management, financial management, and public relations.

Kamp (1996) recognizes that in order for a horticultural therapy programme/project to function properly, an important operational aspect is budgets. It must make provision for staff, training, supplies, equipment, and plant material replacement.

The accounts provided by previous research studies and the experiences of the current research study, therefore provide guidelines for a complete investigation of the requirements for a horticulturist to start a horticultural therapy service in South Africa. The requirements are very generic and are similar to the essentials required for most business plans (Neuland and Van Reenen, 1994).

#### **5.3.4.1 Business Plan**

##### **5.3.4.1.1 Executive Summary**

###### **5.3.4.1.1.1 Business Concept**

Horticultural therapy is a process through which plants, gardening activities, and the innate closeness we feel towards nature are used as vehicles in professionally conducted programmes of therapy and rehabilitation.

###### **5.3.4.1.1.2 Why The Need For This Service?**

Universally there are many public gardens that offer community outreach services to a variety of healthcare institutions. Public gardens employ a qualified horticultural therapist or a horticulturist to coordinate the project. The services rendered by the garden will be on a contract basis. (Simson and Straus, 1998).

In South Africa, and particularly the Western Cape, the mental healthcare system is in a state of change. Hospitals are finding the need to provide more thorough and

more rapid treatment with less resources. The results of a survey conducted (October, 1998) amongst state funded hospitals and private healthcare centers, indicate that there is a need for a structured horticultural therapy service rendered to hospitals. In certain instances State hospitals have been given autonomy by the state to select their service providers.

More recently there has been a keen interest from potential sponsors to financially support an initiative of this kind. Potential sponsors consider horticultural therapy as an opportunity to develop links with community organizations.

Many healthcare professionals are not aware of the activities related to gardening, therefore, a horticultural therapist can develop and demonstrate the benefits of the partnership of people and plants.

#### **5.3.4.1.1.3 Key Factors:**

Horticultural therapist (HT) service will operate as a close corporation (cc). The cc will be free of many of the formal requirements that govern companies and offers an attractive alternative to entrepreneurs. HT will work independently or with clinicians, therapeutic recreation specialist, gardeners, and community volunteers. The HT will make contact/set up a relationship with the client/hospital in a multitude of ways. The most effective way of engagement with clients would be done by giving presentations, seminars and lectures, teaching courses, and workshops. The approach is not clinical or treatment oriented. Clients engage in gardening related tasks. The therapist's goal is to enhance well-being within the clients and promote and increase interaction among clients and others, reduce stress, improve nutrition and lower food expenses, develop a skill provide, exercise, or cultivate a sense of belonging. The varied and adaptable nature of horticulture allows for a challenging and successful performance by clients.

Clients work with indoor plants, flowers, landscaping, and crop production. The results are tangible and valued by society for their beauty and utility.

Horticultural therapy service presents diverse programmes, which are accommodative of many different people at all stages of life, conditions, and circumstances. Identified settings will include: Retired living, Physical rehabilitation hospitals, Community gardens, Adult day care centers, and Mental health care centers.

The fee charged by the horticultural therapists will be based on a market related formula. The calculation of the profit will be market related i.e. between 10 and 12%.

**Daily labour rate + Fixed overhead + Direct expenses + profit = daily fee**

**R300 + R385.00 + R72.00 + R83.00 = R840.75**

The horticultural therapy service's annual budget will be **R201 780.00**. The programme's annual income will consist of charges for fees for services. Sales of the products of horticultural therapy programmes will generate a form of income for clients, which may help subsidize client fees.

#### **5.3.4.1.1.4 Vision Statement**

To render an effective horticultural therapist service, and employ sound therapeutic techniques, which are client-centered in order for clients to regain a sense of place and control in the community.

To always be available to our client and maintain the personal touch.

To give the client more than is expected.

To be quick in responding to client questions or needs.

To make sure the client is satisfied.

To create a medium for all South Africans to enjoy and appreciate the beauty and uniqueness of South Africa's rich plant life.

### **5.3.4.1.2 Market Analysis**

#### **5.3.4.1.2.1 The Overall Market:**

The concept of HT is relatively new in South Africa, particularly the Western Cape region. The results of a survey conducted in 1998 shows that state funded hospitals and private healthcare centers can benefit from a programme, which combines gardening with traditional clinical rehabilitation programmes. Government healthcare institutions showed an overwhelming response to incorporate plants with existing remedial programmes.

With the recent deregulation of the healthcare services, government institutions have autonomy to select their service providers. Backed by effective, original advertisements, it is anticipated that Branching-out HT service can capture 60% of state institutions in the Western Cape. The survey ascertained that private hospitals are interested in alternative therapy for their clientele, but these hospitals could not guarantee whether private medical aid companies would pay for this form of rehabilitation.

National Botanical Institute (NBI) in the form of the Kirstenbosch Outreach Greening Programme and Peninsula Technikon Horticulture Programme were the first to engaged in a horticultural therapy pilot project. Its aims were to focus on the therapeutic benefits of plants.

Branching –out HT services will work in collaboration with NBI and combine resources of staff and materials.

#### **5.3.4.1.2.2 Competing Therapies:**

Horticulture therapy is a hands-on practice. Considering there are alternative therapies that may well compete with HT, the following reasons make HT a more attractive service:

Utilizes low cost overheads and materials (working outdoors with soils).

Rewards are tangible.



Content of programmes can be adjusted to suit the level of competency of participants.

Outcomes are skills development.

Prepares participant for a sheltered employment environment.

Has a successful track record of integrating successfully with medically oriented therapies

**The following are alternative hands-on therapies, which may compete with horticulture:**

Horse Therapy or Equitherapy

Pet Therapy

Music Therapy

Art Therapy

#### **5.3.4.1.2.3 Associated Therapies:**

The following forms of therapies are medically oriented and will be integrated with HT:

Physiotherapy

Occupational Therapy

Speech Therapy

Massage Therapy

Psychotherapy

#### **5.3.4.1.2.4 Target Market And Customers:**

The service will be designed to assist individuals in recovery from illness or injury into the mainstream of society. The broad application of HT services will include targeting the following settings and service recipients, which are both private and public:

#### 5.3.4.1.2.5 Focused Settings:

**Rehabilitation hospitals:** Horticultural therapy is brought to the patients who are unable to leave his or her room. The activity would be brought in via a rolling cart containing pots, soil, tools, and grow-light units.

**Psychiatric Hospitals:** Horticultural therapy is typically incorporated into a broader activity-therapy, and patients receive treatment in groups both on an inpatient or outpatient status.

**Long-Term Residential Care Facilities:** Serving primarily older persons needing skilled nursing care. Physical and mental health of residents is promoted and maintained through gardening and plant-related activity therapies. Facilities will include outdoor gardens with raised beds and containers, and indoor windowsill or artificial light gardens.

**Community Gardens:** There are many communities who have expressed a desire to grow and cultivate their own food. The HT will work with disadvantaged populations to improve social integration, personal satisfaction and overall well-being.

#### 5.3.4.1.2.6 Service Recipients:

Within these various medically focused settings, the range of populations served by horticultural therapy will include people who have had or have the following:

Mental health (Psychiatric, Intellectual challenged, Forensic)

Socially/Economically disadvantaged

Chronic or terminal illness (AIDS and cancer patients)

Aging adults (Senior centers)

Homeless

Community garden projects

Spinal cord and traumatic brain injuries.

Orthopedic injuries.

Stroke survivors.

**5.3.4.1.2.7 Advertisement:**

The following marketing opportunities will be explored:

Writing newsletters

Magazine articles (SA Gardening, Green Fingers, House & Garden)

Letters to newspaper editors, and columns.

Cold calls will be made to businesses that fit the description of a potential client.

Word of mouth.

A direct mail campaign, which may involve sending letters or postcards to potential clients.

**5.3.4.1.3. Financial Position And Forecast**

An estimated forecast operating budget for a twelve-month period, June 2004 to June 2005 include the following items:

**Fixed Cost:**

Refreshments	R1 500.00
Soil mixes	R2 000.00
Fertilizers	R2 000.00
Administration accessories	R2 000.00
Garden tools	R4 000.00
Plant material	R6 000.00

**Variable Cost:**

Transportation	R8 400.00
Office rental & overheads	R84 000.00

**FEE R72 000.00**

**PROFIT R19 920.00**

**TOTAL COST R201 820.00**

### 5.3.4.1.3.1 Existing Finance, Sponsorship & Loan Applications:

There presently are no available funds to start-up the business. It is envisaged that the start-up cost will amount to **R201 820.00**.

Sponsorship and donations will be sourced, but at this stage there are no guarantees.

Financial institutions provide 100% (R201 820.00) of the funding in the form of loans. Once the business is in operation 36% (R72 000.00) will be sourced from charges for fees for services.

Sales of the horticultural therapy products will generate a form of income for clients, which will help subsidize client fees.

### 5.3.4.1.3.2 Income:

Participants fee structure:

Figure 5.1

**Daily labour rate + Fixed overhead + Direct expenses + profit = daily fee**

**R300 + R385.00 + R72.00 + R83.00 = R840.75**

**R840.75 X 20 work days per month X 12 months = R201 780.00**

Figure 5.2

<b>ABRIDGE FORECASTED INCOME STATEMENT OF BRANCHING-OUT                      HORTICULTURAL THERAPY SERVICES (June 2004-June 2005)</b>		
<b>Direct Cost:</b>		
Refreshments	R1 500.00	
Soil mixes	R2 000.00	
Fertilizers	R2 000.00	
Administration accessories	R2 000.00	
Garden tools	R4 000.00	
Plant material	R6 000.00	
Transportation	R8 400.00	
Office rental & overheads	R84 000.00	
<b>Fee:</b>		R72 000.00
	<b><u>R109 900.00</u></b>	
<b>Profit for the year</b>		<b>R19 920.00</b>

**5.3.4.1.4 Staff Complement**

The team that will run the business will consist of qualified personnel.

**Figure 5.3**

<b>No. of personnel &amp; description:</b>	<b>Strengths</b>	<b>Weaknesses</b>
Technical staff (Permanent workforce): 2 Horticulturist	Strong community horticultural background. Previously worked side-by-side with disabled/handicapped participants. Strong programme/project management skills. Strategic planning, identify target markets, conduct quality checks, public relations, Research and development, Identify resources Selection of staff and clients	Cannot perform the duties of a trained medical therapist / practitioner. Lack insight into small-medium enterprise operations. Lack financial management skills. Require help re. remuneration and recruiting policy. Require assistance re operational management issues. Aspects regarding client/staff contract specifications/agreements.

**Figure 5.3 (continue)**

<b>No. of personnel &amp; description:</b>	<b>Strengths</b>	<b>Weaknesses</b>
<p>Interdisciplinary Team</p> <p>Members:</p> <p>Psychiatrist</p> <p>Behavioral Psychologist</p> <p>Rehabilitation nurse</p> <p>Occupational therapist</p> <p>Social worker</p>	<p>Have an in-depth knowledge about the clinical history of participants.</p> <p>Aware of the hospital environment.</p> <p>Coordinated and integrated medical approach will help participants improve cognitively, emotionally and physically.</p>	<p>No horticultural knowledge.</p>
<p>Part-time support staff:</p> <p>1 Account</p>	<p>Strong financial analytical expertise in the following aspects:</p> <p>Taxes, determine profitability, conduct financial projections, .</p>	<p>No horticultural knowledge.</p>
<p>1 Advertisement specialist</p>	<p>Market oriented</p>	<p>No horticultural knowledge</p>

## **6. RECOMMENDATIONS**

### **6.1 Introduction**

The results of this study make it possible for the recommendation and exploration of criteria, environments, and elements that advance the therapeutic qualities of programmes and gardens. The recommendations are intended to emphasize design qualities that may be incorporated into a horticultural therapy programme. It also attempts to address the problems and difficulties that have arisen during the research project.

### **6.2 Essential Considerations For Future Programmes**

#### **6.2.1 Initial Planning**

It is recommendable that the initial planning encompasses an assessment, needs, and feasibility study of starting a programme. This starting process would outline/highlight areas of concern, identify specific challenges, and may outline how these problem areas could be resolved. The identification of the correct project research fundamentals is critical. This includes the following aspects:

- Establishing good communication with administrators and staff at the facility.  
Receiving approval from clients and/or their families to conduct the research.
- Ensuring the researcher secures long-term support and interest.
- The philosophies and goals of the client must be recognized.
- The availability of space and resources must be ascertained.
- Institutional rules that can affect the project must be taken into account.
- The nature of supplies and tools must be clearly explained to staff and administrators.



- Orientation training and discussion of objectives must be a requirement with all volunteers.

### **6.2.2 Appropriate Selection Of Participants And Activities.**

For a horticultural therapy programme to be successful it must be guided by a good plan since it is this plan that will maintain the cohesion of the overall project.

The research study has shown that careful selection of activities and participants formed a significant building block of the entire requirements of the programme. The activities for this research were very generic in its make up, and although patients were consulted, the activities were not designed to accurately/appropriately reflect the individual needs. With this in mind the question must be asked: "how accurate were the participants' potential/abilities measured, and how accurate were activities identified to match the abilities and needs"? To accurately measure the participant's abilities, a needs assessment/analysis should have been conducted of each individual participant. For this research project an assessment was done for each group of patients.

Based on the advice provided by hospital staff, it is preferable that part of the participant analysis be focused on sheltered/supported employment. In terms of the social problems experienced locally, employment readiness must become the desired objective of a locally based horticultural therapy programme. Future programmes and the subsequent assessments and designed activities must therefore take into account work preparedness skills of the participant.

Information obtained from consultations and interviews with participants and the hospital staff indicates that horticultural therapy would be more beneficial for the participant placed in a supported employment environment. It is advisable that job preparedness be centered on activities, which rediscovers the hidden skills within the individual. Observations during the research showed that activities, which allowed for relearning of specific skills, such as problem solving, sequencing, memory, writing, decision-making, judgment, following directions, and social interaction, and promotion of self-confidence and self-esteem, received a relatively

high score for task accomplishment. The rediscovery of specific skills could be transferred into a non-horticultural job setting.

The research has shown that certain activities were too easy and resulted in boredom. Other activities were too complex and caused frustration. Based on the results and the overall outcome of the project, the following aspects may be used as a guide for the inclusion of activities in a future programme:

Forensic patients generally responded positively to all the activities. It is therefore recommended that general gardening activities and plant related materials are therefore considered to be desirable for forensic patients. Gardening will serve to improve and maintain interest and motivation levels of these individuals. The results show that forensics prefer, or can cope with activities which are advanced and complex in its make up. The results indicate that it is advisable to choose participants, who have had some previous connection with plants in the past. This connection contributes positively to the motivational levels of the participants.

The results illustrate that activities 6, 7, and 10, can be recommended for intellectual patients. These activities involved planting of mixed herbs into containers, participating in groups and engaging in the planting of strawberry plants, as well as partaking in general garden maintenance, which included transplanting of groundcovers into open areas. For these activities this patient group required no supervision. The positive response received for activities later in the programme, based on information obtained from interviews, indicates that intellectual patients took much longer to cope with the adjustment of working with plants. Through feedback provided by participants and clinicians, working with unfamiliar facilitators and foreign materials directly affected the individual ability to complete certain tasks. It therefore becomes fundamental that prior to commencement of a session, the facilitators orientate all participants to the various materials, elements (people, tools etc) and procedures. A complete overview of the activity content must be presented to all concerned individuals.

The results illustrate that activities 1, 5, 6, 7, and 8 are recommended for psychiatric patients. These activities involved planting of indigenous groundcover, planting of

scented geranium cuttings, planting of mixed herb plants into containers, participating in groups to plant strawberry plants, and participating in groups to plant flowering plants. Psychiatric patients related better to activities, which involved plants which were indigenous, had scented, and herbal properties. The recommendations are based on the fact that these activities resulted in a sound working relationship between participants, clinicians, and horticulturist. The repetitive nature of the tasks accelerated the process of helping the patients develop conscious control of following instructions.

### **6.2.3 Facility Considerations**

The research process has revealed that certain generic factors/considerations pertaining to the facility and staff can be recommended, and cognizance must be taken of these factors to ensure successful implementation. The research findings therefore make it possible for the following recommendations:

A formal application must be presented to the institution (hospital) requesting permission/approval for commencement of the programme.

The horticulturist may want to ascertain what kind of support (financial, administrative, staff) the programme will receive from the management of the hospital.

Horticulturists together with clinicians must identify/study an appropriate venue (either outdoors or indoors), and become familiarized with the logistics of the building. Safety considerations must be a primary concern. The venue must be able to comfortably accommodate the working group, and must be available for the entire duration of the programme.

It is paramount to ascertain staff availability/commitment for the entire duration of the programme, and whether hospital staff will be involved in the process of data gathering/collection.

### **6.2.4 Assessment Procedure**

The research experimentation process used the Horticultural Pre-test Questionnaire and the Activity Effectiveness Evaluation Form, as the main measuring tools. Patient

levels of task accomplishment were measured, but there were no assessments conducted after patients successfully or unsuccessfully completed the activities. It is therefore recommended that a pre-test and post-test experimental design be applied for future research purposes. This design process would provide more accurate information on the effectiveness of the programme.

#### **6.2.5 Enhancement Of Design Qualities:**

This study illustrated that other than the design of activities and the assessment of participants, other significant areas exist, which may ultimately improve the general quality of the programme. These significant areas include site analysis, diversity in site design, accessibility and ease of use, diversity of plant material, and quality of maintenance.

#### **6.2.6 Problem Areas**

The research process included horticulturist, occupational therapist, social workers, and psychologist. The horticulturists understanding in terms of human dynamic issues of the patient, was limited. This at times complicated communication and understanding between the horticulturists, patients and hospital staff. It is therefore highly recommended that the horticulturists have a broad understanding of the various psychiatric disorders, the terminology, and the specific needs of patients. It is advisable that prior to the programme, the horticultural team receives a briefing on basic techniques used to deal with or resolve behavioral issues related to the patients and milieu of the institution. This approach emphasizes a holistic understanding of the participant, is client centered, and helps the horticulturist effectively articulate therapy objectives.

#### **6.2.7 Future Training**

The research report wholeheartedly advocate cross-pollination amongst horticulturist and healthcare practitioners. Many clinicians, psychologist, nurses, occupational therapist, and social workers, are not trained in the theoretical or practical usefulness of plants and environmental aesthetics. Thus they are ill equipped to apply methods of horticulture in a human environment. On the other hand many

horticulturist are not trained in the field of psychology, thus they cannot identify or apply psychological methods in a human environment.

It is highly recommended that collaborative efforts among these disciplines could be beneficial to all involved. It highlights the importance of the design of an integrated educational therapy curriculum in which horticulture is pivotal and provides the practical component. Egypt is one example of a country that developed a comprehensive horticultural therapy programme in a challenging environment (Wotowiec, 1998).

Through horticulture Egypt came to realize that horticulture is an excellent tool for education, business, and pleasure. South Africa, as in the case with Egypt, share a strong historical connection with agriculture and subsequently greening activities. Both nations are also dedicated to human training.

Future training and course structure/compilation will be guided by the experience gained during the research process. The following topics will be given priority in a possible course outline:

#### **6.2.7.1 Proposed Course Outline:**

##### **Module 1**

History of horticulture as therapy.  
Significance of horticultural therapy.

##### **Module 2**

Introductory psychology  
Psychological goals and objectives  
An overview of psychological treatment approaches and diagnostic codes.

##### **Module 2**

Introductory horticulture  
Horticultural goals and objectives  
Adaptive tools and equipment

### **Module 3**

Choosing the client population

Client safety/precautions.

Site/space/facility analysis (Accessibility & infrastructure).

### **Module 4**

- Developing a consultation service.

Marketing your service.

Formulating contracts and developing budgets

## 7. CONCLUSION

Prior to the commencement of this research work, none of the horticultural work at hospitals had been translated to concrete data. In the Western Cape it is common to hear about anecdotal evidence of the benefits of plant to humans (Unpublished survey by October, 1998). The research report therefore has highlighted the importance of developing an accurate knowledge of how people respond to plants.

Without knowledge of how people respond to different horticultural stimuli, it becomes difficult to assess the full range of potential benefits associated with horticulture.

The research has shown that plant related activities, when successfully integrated into a rehabilitation programme, will benefit participants. Based on the results it can be concluded that a previous association with plants had a positive or negative bearing on the outcome of each activity, while no previous association had a negative effect.

A previous connection with plants, made a significant difference in participants' motivation for completing the task. This was particularly true for forensic patients. The results show that forensic patients demonstrated a consistent, and purposeful response to all activities. This patient group required no supervision during the programme.

The vast array of disabilities experienced by intellectually challenged, who lacked basic writing and communication skills, presented numerous problems and consequently resulted in a medium and low level of task accomplishment. For the psychiatric patients, the repetitive nature of certain horticultural tasks accelerated the process of helping the patient develop conscious control of following instructions, and subsequently their actions. It is significant to mention that although plant materials serves as a vehicle to connect the facilitator to their participants, it is also

the facilitator, with the correct approach, who can promote growth and development within the participants.

The outcome of the research and the concept of horticultural therapy coincide with national and international psychiatric facility trends - the move towards de-institutionalization of mentally ill people. This approach by government is constitutionally supported by the New Mental Health Care Act, which serves to encourage home and community based care of patients (Maja and Diliza, 2004).

Although there are positive signs such as the New Mental Health Care Act, which may encourage an environment conducive for horticultural therapy, there simultaneously exists ominous trends, which may threaten the concept of gardening as form of rehabilitation. This threat presents itself in the following manner: At a national level there is inadequate funding to sustain the operations at psychiatric clinics. This has resulted in a tragic consequence – the closure of many hospital care facilities. In South Africa psychiatric hospitals have been closed in favour of providing primary healthcare, which has led to the deterioration of mental health services in rural areas (Wilson, 2004). In impoverished areas nurses and social workers fight a daily losing battle trying to help people suffering from mental illness. South Africa is losing skilled psychiatrists as rapidly as they are graduating. Psychiatric community services are non-existent in certain parts of South Africa (Philips, 2004). The government can dither no more. It has to make a strong and unequivocal stand now or the situation will drastically worsen.

Amidst the impoverished state of affairs at State institutions, this situation must not stifle the growth of horticultural therapy. To maintain the feasibility of horticulture as a business option, it is imperative that future programmes, not only focus on parastatals, but be directed towards private clinics/convalescent centers.

The findings and recommendations provide guidelines for the formulation of a structured horticultural therapy programme. It encourages diversification of the horticultural profession in South Africa. The concept of utilizing gardening as a form of therapy may prove to be critical to the survival of the horticultural profession in South Africa.



The state of affairs of horticulture, in South Africa is unfortunate because the profession is largely focused on commercial practices (retailing, landscaping, and wholesaling) rather than on the health benefits of horticulture. Documented evidence of health-related benefits of horticulture could prove to be a powerful political tool for horticulturists faced with policy makers and decision makers who may undervalue the contribution of horticulture to our society and ultimately to our economy.

Through the research process it became possible for horticulture to network with associated fields of interest. A particular field of interest is traditional healers and pharmacology, dealing with indigenous plants and their pharmaceutical importance to local communities. This may form a future initiative for research collaboration in local communities of the Western Cape.

I hope that this study has demonstrated that we have progressed beyond having only anecdotal evidence for the value of plants to people. Anecdotes must be used to generate future research questions.

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<http://www.gdrc.org/imc/micro/business-plan.html>

# Appendix A

## A 1: Letter of Consent



# PENINSULA TECHNIKON

P.O. Box 1906 • Bellville 7535 South Africa • Tel: +27 21 959 6276 • Fax +27 21 959

6095 Symphony Road Bellville 7535

## DEPARTMENT OF HORTICULTURE & FOOD TECHNOLOGY LETTER OF CONSENT

### Dear Hospital staff member

The purpose of this study is to design a Horticultural Therapy Model (Gardening Therapy Manual) for a horticulturist interacting with a healthcare worker at a healthcare institution.

### Procedure:

The selected patients will be given an overview of the process prior to its commencement. Participants (patients) will engage in gardening activities, which will involve working with plant material, soil, hand-tools, pots and plant labels. Patient response to gardening activities will be assessed by means of the Activity Effectiveness Evaluation Form, observations and interviews. Observations will be conducted by a horticulturist and participating hospital staff.

The research teams primary responsibility is to the patient. We will fulfil the following:

1. Continuously respect the needs of the participating patients.
2. Should there be any adjustments to the process, it will be communicated to the patient and hospital staff.
3. Respect the privacy of the patient we serve, and shall safeguard all information and materials obtained during the therapeutic horticultural activity process.
4. The study shall not involve practices/activities that does not receive the approval of patients and hospital staff.
5. No person to alter or falsify any information related to the study.
6. All results to be published and disseminated must be 100% correct. No member of the research staff shall encourage/coach patients to give false responses regarding research results.

7. Patients and staff will not work with activity accessories (sharp tools, chemical fertilizers and pesticide), which may cause a safety risk to participants and the immediate environment.

**Information disclosure:**

1. Information generated during the study may be communicated to those with an essential interest in horticultural therapy. In order for this to occur permission granted by the hospital, staff and patients must be a prerequisite. The hospital, staff and patients shall be made aware of the recipient of such information.
2. If information is used in teaching, seminars, workshops, publications, research or writing, the identity of the hospital, staff and patient served shall be protected and remain confidential.
3. The results of the research will not contain the true identity of the hospital, staff and patients. The information will be encoded and hospital, staff and patients will be referred to by numbers and/or letters.

The research team at all times will be rendering a service to the patient and shall be aware that the nature of the service must at all times be professional and promote the welfare of patients and their environment.

**IMPORTANT:** In order for the research to commence the researcher, hospital staff, guardian and participant must agree to the procedure and conditions as outlined in the **Letter of Consent:**

I \_\_\_\_\_ researcher/project leader undertake to fulfill the procedure and conditions as outlined in the Letter of Consent.

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

**Participating staff:**

I \_\_\_\_\_ (print name of hospital staff) understand and agree to the procedure and conditions as outlined in the Letter of Consent. I undertake to support the research project.

**A 2: Represents data, which was entered from the AEE questionnaire:**

No	Data	Description
1	A number corresponding to the specific activity (1-10)	10 Activities where used
2.	A number to represent patient name.	This number was used to protect the identity of the subjects
3.	Date of activity	
4.	A numeric score for each item ranging from 1 – 4.	1 - not at all 2 - sometimes 3 - most of the time 4 - the whole time
5.	A sum score for the activity	The sum of the numeric scores for each item on the questionnaire. The total score for the questionnaire is 88
6.	A percentage score for the activity	The percentage was calculated using the following formula: $(\text{Sum score} / \text{Total}) \times 100$
7.	A category score for the activity	The score was calculated using the following categories: 1 – Low (0 – 45%) 2 - Medium (46% - 69%) 3 - High (70% - 100%)
8.	Sum scores each of the 3 subsections of the questionnaire.	The sum of the numeric scores for each item in the subsection on the questionnaire. The total score for the each subsection is: Avocational & educational interests (AEI) - 44 Interpersonal/social (IS) -28 Responsibility (R) – 16
9.	Percentage scores each of the 3 subsections of the questionnaire.	The percentage was calculated using the following formula: $(\text{Sum subsection score} / \text{Subsection Total}) \times 100$
10.	Category scores each of the 3 subsections of the questionnaire.	The score was calculated using the following categories: 1 – Low (0 – 45%) 2 - Medium (46% - 69%) 3 - High (70% - 100%)

## Appendix B

### Detailed Results And Calculations

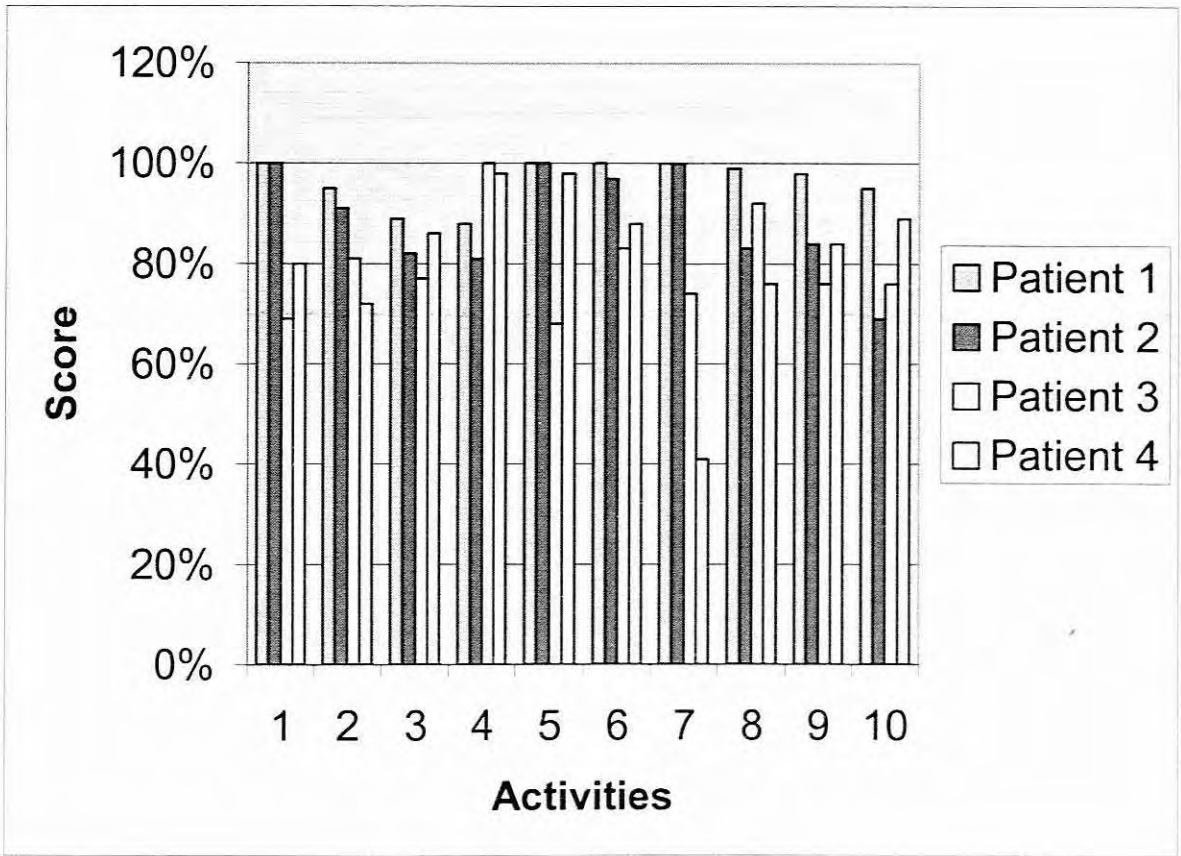
**B1: Data collected via the Activity Effectiveness Evaluation recorded the following results for the Forensic patients (P1, P2, P3, P4)**

Forensics Patients 1, 2, 3 & 4				
No	Type of activity	Score: (sum score/total score) x 100		Level of task accomplishment by patient:
1.	A mix planting of indigenous groundcover in a container	P1	100%	High
		P2	100%	High
		P3	69%	Medium
		P4	80%	High
2.	Planting a mixture of rooted vegetable cuttings.	P1	95%	High
		P2	91%	High
		P3	81%	High
		P4	72%	High
3.	Sowing a mixture of vegetable seed	P1	89%	High
		P2	82%	High
		P3	77%	High
		P4	86%	High
4.	Weeding, mulching, removal of dead plants, planting of shrubs and groundcover	P1	88%	High
		P2	81%	High
		P3	100%	High
		P4	98%	High

**B1**

No	Type of activity	Score: (sum score/total score) x 100		Level of task accomplishment by patient:
5.	Planting of scented geranium cuttings to grow in a sunny position	P1	100%	High
		P2	100%	High
		P3	68%	Medium
		P4	98%	High
6.	Planting of mixed herb plants into a container.	P1	100%	High
		P2	97%	High
		P3	83%	High
		P4	88%	High
7.	Participants form groups of three an engage in the planting of strawberry plants.	P1	100%	High
		P2	100%	High
		P3	74%	High
		P4	41%	Low
8.	Participants form groups of three an engage in the planting of flowering annuals.	P1	99%	High
		P2	83%	High
		P3	92%	High
		P4	76%	High
9.	Participants prick out herb seedlings and transplant this into large containers.	P1	98%	High
		P2	84%	High
		P3	76%	High
			84%	High
10.	Participants partake in general garden maintenance, which included transplanting of groundcovers into garden area.	P1	95%	High
		P2	69%	Medium
		P3	76%	High
		P4	89%	High

Chart B 1



**B2: Data collected via the Activity Effectiveness Evaluation recorded the following results for Intellectually Challenge patients (P5, P6, P7, P8)**

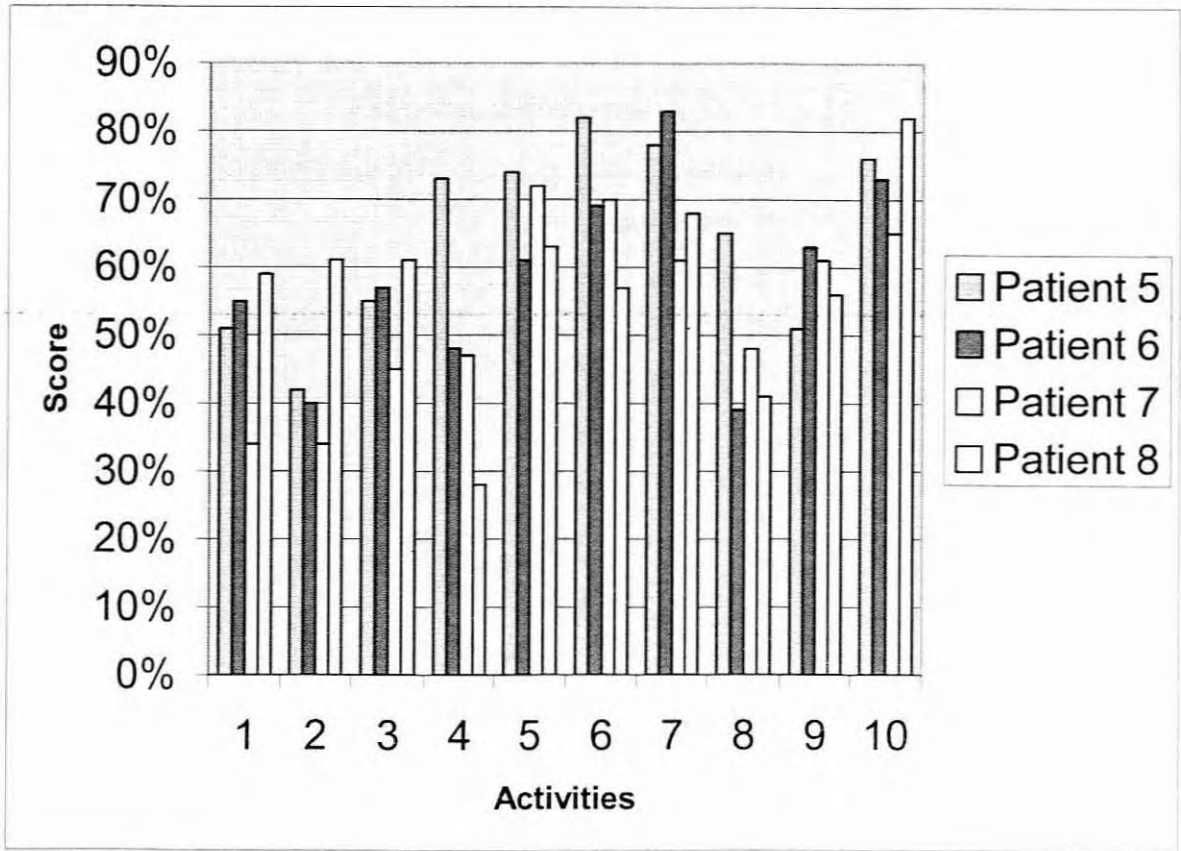
<b>Intellectually Challenge Patients 5, 6, 7 &amp; 8</b>				
<b>No</b>	<b>Type of activity</b>	<b>Score: (sum score/total score) x 100</b>		<b>Level of task accomplishment by patient:</b>
1.	A mix planting of indigenous groundcover in a container	P5	51%	Medium
		P6	55%	Medium
		P7	34%	Low
		P8	59%	Medium
2.	Planting a mixture of rooted vegetable cuttings.	P5	42%	Low
		P6	40%	Low
		P7	34%	Low
		P8	61%	Medium
3.	Sowing a mixture of vegetable seed	P5	55%	Medium
		P6	57%	Medium
		P7	45%	Low
		P8	61%	Medium
4.	Weeding, mulching, removal of dead plants, planting of shrubs and groundcover	P5	73%	High
		P6	48%	Medium
		P7	47%	Medium
		P8	28%	Low



**B2**

No	Type of activity	Score: (sum score/total score) x 100		Level of task accomplishment by patient:
5.	Planting of scented geranium cuttings to grow in a sunny position	P5	74%	High
		P6	61%	Medium
		P7	72%	High
		P8	63%	Medium
6.	Planting of mixed herb plants into a container.		82%	High
		P5		
		P6	69%	Medium
		P7	70%	High
7.	Participants form groups of three an engage in the planting of strawberry plants.	P5	78%	High
		P6	83%	High
		P7	61%	Medium
		P8	68%	Medium
8.	Participants form groups of three an engage in the planting of flowering annuals.	P5	65%	Medium
		P6	39%	Low
		P7	48%	Medium
		P8	41%	Low
9.	Participants prick out herb seedlings and transplant this into large containers.	P5	51%	Medium
		P6	63%	Medium
		P7	61%	Medium
		P8	56%	Medium
10.	Participants partake in general garden maintenance, which included transplanting of groundcovers into garden area.	P5	76%	High
		P6	73%	High
		P7	65%	Medium
		P8	82%	High

Chart B2



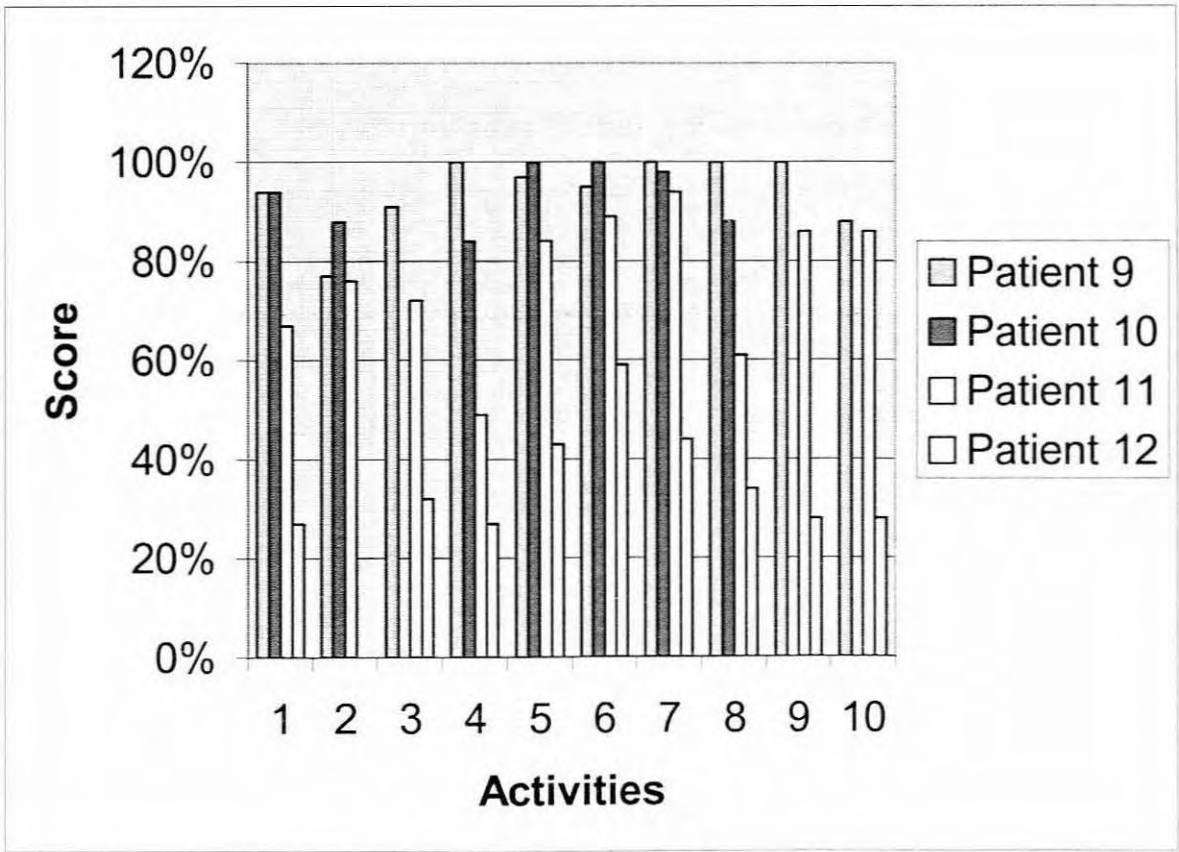
**B3: Data collected via the Activity Effectiveness Evaluation recorded the following results for Psychiatric patients (P9, P10, P11, P12)**

<b>Psychiatric Patients 9, 10, 11 &amp; 12</b>				
<b>No</b>	<b>Type of activity</b>	<b>Score: (sum score/total score) x 100</b>		<b>Level of task accomplishment by patient:</b>
1.	A mix planting of indigenous groundcover in a container	P9	94%	High
		P10	94%	High
		P11	67%	Medium
		P12	27%	Low
2.	Planting a mixture of rooted vegetable cuttings.	P9	77%	High
		P10	88%	High
		P11	76%	High
		P12	Absent	Absent
3.	Sowing a mixture of vegetable seed	P9	91%	High
		P10	Absent	Absent
		P11	72%	High
		P12	32%	Low
4.	Weeding, mulching, removal of dead plants, planting of shrubs and groundcover	P9	100%	High
		P10	84%	High
		P11	49%	Medium
		P12	27%	Low

**B3**

No	Type of activity	Score: (sum score/total score) x 100		Level of task accomplishment by patient:
5.	Planting of scented geranium cuttings to grow in a sunny position	P9	97%	High
		P10	100%	High
		P11	84%	High
		P12	43%	Low
6.	Planting of mixed herb plants into a container.	P9	95%	High
		P10	100%	High
		P11	89%	High
		P12	59%	Medium
7.	Participants form groups of three an engage in the planting of strawberry plants.	P9	100%	High
		P10	98%	High
		P11	94%	High
		P12	44%	Low
8.	Participants form groups of three an engage in the planting of flowering annuals.	P9	100%	High
		P10	88%	High
		P11	61%	Medium
		P12	34%	Low
9.	Participants prick out herb seedlings and transplant this into large containers.	P9	100%	High
		P10	Absent	Absent
		P11	86%	High
		P12	28%	Low
10.	Participants partake in general garden maintenance, which included transplanting of groundcovers into garden area.	P9	88%	High
		P10	Absent	Absent
		P11	86%	High
		P12	28%	Low

Chart B3



**B4: A comparison of the level of task accomplishment per activity by Forensic patients for each of the sub-sections (categories) of Activity Effectiveness Evaluation:**

AEE sub-sections		Avocational/educational		Interpersonal/social		Responsibility	
		(sum score per sub-section/total score) X100	Level of task accomplishment by patient	(sum score per sub-section/total score) X100	Level of task accomplishment by patient	(sum score per sub-section/total score) X100	Level of task accomplishment by patient
<b>Activity 1</b>	P1	100%	High	100%	High	100%	High
	P2	100%	High	100%	High	100%	High
	P3	77%	High	61%	Medium	88%	High
	P4	77%	High	89%	High	81%	High
<b>Activity 2</b>	P1	100%	High	96%	High	81%	High
	P2	100%	High	82%	High	81%	High
	P3	100%	High	94%	High	75%	High
	P4	100%	High	56%	Medium	63%	Medium
<b>Activity 3</b>	P1	100%	High	64%	Medium	100%	High
	P2	100%	High	93%	High	81%	High
	P3	95%	High	75%	High	88%	High
	P4	77%	High	93%	High	100%	High
<b>Activity 4</b>	P1	91%	High	96%	High	63%	Medium
	P2	100%	High	71%	High	43%	Low
	P3	100%	High	100%	High	100%	High
	P4	98%	High	100%	High	94%	High
<b>Activity 5</b>	P1	100%	High	100%	High	100%	High
	P2	100%	High	100%	High	100%	High
	P3	80%	High	94%	High	63%	Medium
	P4	95%	High	100%	High	100%	High
<b>Activity 6</b>	P1	100%	High	100%	High	100%	High
	P2	100%	High	89%	High	100%	High
	P3	86%	High	68%	Medium	100%	High
	P4	100%	High	89%	High	100%	High
<b>Activity 7</b>	P1	100%	High	100%	High	100%	High
	P2	100%	High	100%	High	100%	High
	P3	91%	High	89%	High	100%	High
	P4	68%	Medium	42%	Low	31%	Low

**B4**

<b>Activity 8</b>	P1	100%	High	96%	High	100%	High
	P2	97%	High	88%	High	100%	High
	P3	89%	High	96%	High	94%	High
	P4	66%	Medium	79%	High	100%	High
<b>Activity 9</b>	P1	100%	High	93%	High	100%	High
	P2	93%	High	67%	High	88%	High
	P3	91%	High	57%	Medium	69%	Medium
	P4	70%	High	100%	High	94%	High
	P1	93%	High	100%	High	94%	High
	P2	75%	High	88%	High	88%	High
	P3	75%	High	64%	Medium	100%	High
	P4	80%	High	100%	High	94%	High

**B5: A comparison of the level of task accomplishment per activity by Intellectual patients for each of the sub-sections (categories) of Activity Effectiveness Evaluation:**

AEE sub-sections		Avocational/educational		Interpersonal/social		Responsibility	
		(sum score per sub-section/total score) X100	Level of task accomplishment by patient	(sum score per sub-section/total score) X100	Level of task accomplishment by patient	(sum score per sub-section/total score) X100	Level of task accomplishment by patient
<b>Activity 1</b>	P5	100%	High	75%	High	50%	Medium
	P6	34%	Low	100%	High	31%	Low
	P7	27%	Low	36%	Low	50%	Medium
	P8	41%	Low	93%	High	50%	Medium
<b>Activity 2</b>	P5	36%	Low	57%	Medium	31%	Low
	P6	39%	Low	46%	Medium	31%	Low
	P7	36%	Low	32%	Low	31%	Low
	P8	57%	Medium	86%	High	31%	Low
<b>Activity 3</b>	P5	55%	Medium	54%	Medium	56%	Medium
	P6	45%	Low	68%	Medium	69%	Medium
	P7	36%	Low	61%	Medium	44%	Low
	P8	64%	Medium	50%	Medium	75%	High
<b>Activity 4</b>	P5	66%	Medium	79%	High	81%	High
	P6	36%	Low	71%	High	38%	Low
	P7	50%	Medium	50%	Medium	31%	Low
	P8	27%	Low	32%	Low	25%	Low
<b>Activity 5</b>	P5	61%	Medium	89%	High	81%	High
	P6	45%	Low	93%	High	50%	Medium
	P7	60%	Medium	86%	High	81%	High
	P8	57%	Medium	79%	High	50%	Medium
<b>Activity 6</b>	P5	73%	High	89%	High	94%	High
	P6	52%	Medium	82%	High	94%	High
	P7	48%	Medium	93%	High	94%	High
	P8	41%	Low	61%	Medium	94%	High
<b>Activity 7</b>	P5	70%	High	89%	High	81%	High
	P6	75%	High	96%	High	81%	High
	P7	43%	Low	82%	High	75%	High
	P8	52%	Medium	82%	High	88%	High
<b>Activity 8</b>	P5	50%	Medium	88%	High	69%	Medium
	P6	34%	Low	43%	Low	44%	Low
	P7	36%	Low	57%	Medium	63%	Medium
	P8	45%	Low	39%	Low	31%	Low



**B5**

AEE sub-sections		Avocational/educational		Interpersonal/social		Responsibility	
		(sum score per sub-section/total score) X100	Level of task accomplishment by patient	(sum score per sub-section/total score) X100	Level of task accomplishment by patient	(sum score per sub-section/total score) X100	Level of task accomplishment by patient
<b>Activity 9</b>	P5	48%	Medium	61%	Medium	44%	Low
	P6	34%	Low	86%	High	94%	High
	P7	43%	Low	82%	High	75%	High
	P8	43%	Low	50%	Medium	88%	High
<b>Activity 10</b>	P5	61%	Medium	86%	High	100%	High
	P6	48%	Low	100%	High	94%	High
	P7	50%	Medium	71%	High	94%	High
	P8	68%	Medium	93%	High	100%	High

**B6: A comparison the level of task accomplishment per activity by Psychiatric patients for each of the sub-sections (categories) of Activity Effectiveness Evaluation:**

AEE sub-sections		Avocational/educational		Interpersonal/social		Responsibility	
		(sum score per sub-section/total score) X100	Level of task accomplishment by patient	(sum score per sub-section/total score) X100	Level of task accomplishment by patient	(sum score per sub-section/total score) X100	Level of task accomplishment by patient
<b>Activity 1</b>	P9	100%	High	82%	High	100%	High
	P10	89%	High	100%	High	100%	High
	P11	84%	High	36%	Low	76%	High
	P12	27%	Low	29%	Low	25%	Low
<b>Activity 2</b>	P9	93%	High	61%	Medium	63%	Medium
	P10	89%	High	82%	High	94%	High
	P11	96%	High	42%	Low	81%	High
	P12	Absent	Absent	Absent	Absent	Absent	Absent
<b>Activity 3</b>	P9	95%	High	89%	High	81%	High
	P10	Absent	Absent	Absent	Absent	Absent	Absent
	P11	98%	High	36%	Low	63%	Medium
	P12	32%	Low	32%	Low	31%	Low
<b>Activity 4</b>	P9	100%	High	100%	High	100%	High
	P10	75%	High	100%	High	81%	High
	P11	73%	High	25%	Low	25%	Low
	P12	27%	Low	29%	Low	25%	Low
<b>Activity 5</b>	P9	100%	High	93%	High	94%	High
	P10	100%	High	100%	High	100%	High
	P11	95%	High	71%	High	75%	High
	P12	48%	Medium	39%	Low	38%	Low
<b>Activity 6</b>	P9	100%	High	86%	High	100%	High
	P10	100%	High	100%	High	100%	High
	P11	82%	High	93%	High	100%	High
	P12	48%	Medium	68%	Medium	75%	High
<b>Activity 7</b>	P9	100%	High	100%	High	100%	High
	P10	100%	High	100%	High	88%	High
	P11	98%	High	93%	High	88%	High
	P12	39%	Low	57%	Medium	38%	Low
<b>Activity 8</b>	P9	100%	High	100%	High	100%	High
	P10	95%	High	79%	High	81%	High
	P11	82%	High	86%	High	100%	High
	P12	30%	Low	36%	Low	44%	Low

**B6**

AEE sub-sections		Avocational/educational		Interpersonal/social		Responsibility	
		(sum score per sub-section/total score) X100	Level of task accomplishment by patient	(sum score per sub-section/total score) X100	Level of task accomplishment by patient	(sum score per sub-section/total score) X100	Level of task accomplishment by patient
<b>Activity 9</b>	P9	100%	High	100%	High	100%	High
	P10	Absent	Absent	Absent	Absent	Absent	Absent
	P11	86%	High	82%	High	94%	High
	P12	27%	Low	32%	Low	25%	Low
<b>Activity 10</b>	P9	93%	High	71%	High	100%	High
	P10	Absent	Absent	Absent	Absent	Absent	Absent
	P11	91%	High	79%	High	88%	High
	P12	32%	Low	25%	Low	25%	Low